

# Imperial Solar Energy Center West

## Appendix B

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### Traffic Impact Analysis

*Prepared by LOS Engineering, Inc.*

*August 2, 2010*

**Imperial Solar Energy Center WEST  
County of Imperial (I-8 at Dunaway Road)  
August 2, 2010**

**Draft Traffic Impact Analysis**

**Prepared for:**

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Job #1007

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# 1.0 Introduction

The purpose of this study is to determine and analyze traffic impacts for the proposed Imperial Solar Energy Center West Project. The project is a photovoltaic solar facility capable of producing approximately 250 megawatts of electricity on approximately 1,130 acres of previously disturbed agricultural land. The project is generally located east of Dunaway Road and bisected by I-8. The general location of the project is shown in **Figure 1**. A preliminary site plan is included in **Figure 2**.

This report describes the existing roadway network in the vicinity of the project site. It includes a review of the existing and proposed traffic activities for weekday peak AM and PM periods and daily traffic conditions. The format of this study includes the following chapters:

- 1.0 Introduction
- 2.0 Study Methodology
- 3.0 Existing Conditions
- 4.0 Project Description
- 5.0 Year 2012 without and with Project Construct
- 6.0 Cumulative Projects (New Development)
- 7.0 Year 2012 + Cumulative + Project Construction
- 8.0 Horizon Year (2030) + Project Operations
- 9.0 Significant Impacts and Recommended Mitigation Measures
- 10.0 Conclusions and Recommendations
- 11.0 References



**Figure 1: Project Location**

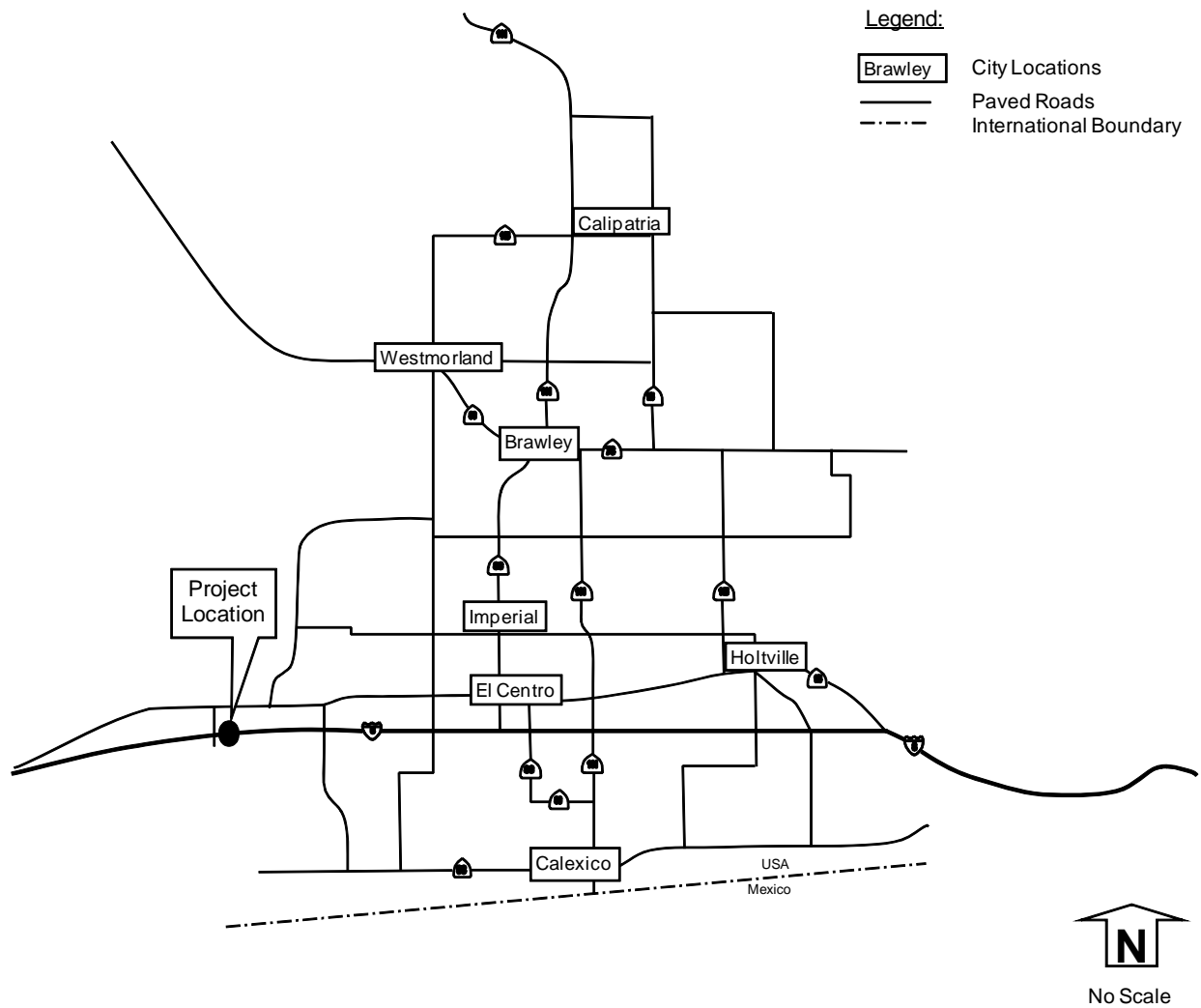
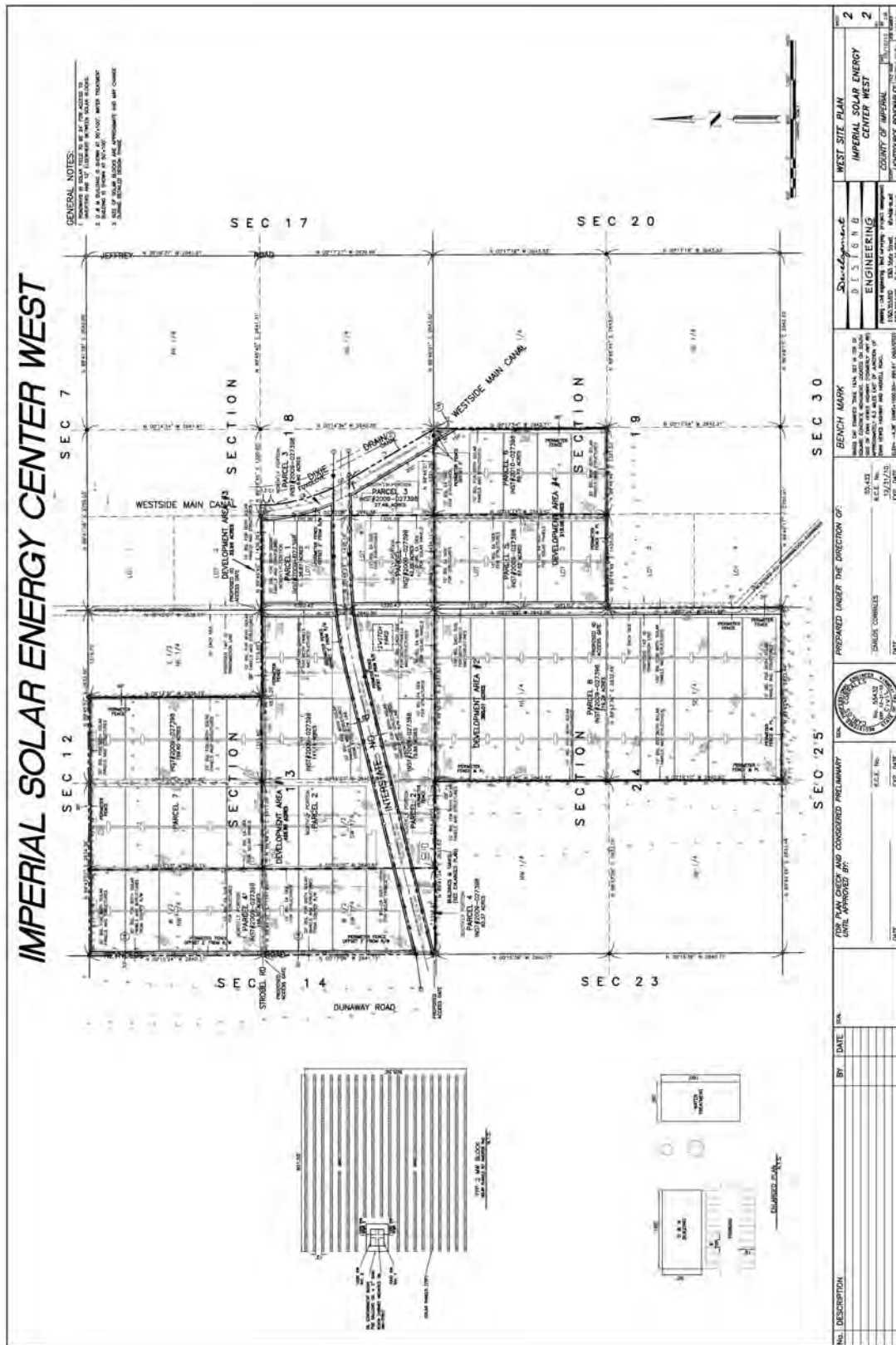


Figure 2: Site Plan



Source: Development Design & Engineering, Inc.

## 2.0 Traffic Analysis Methodology and Significance Criteria

The parameters by which this traffic study was prepared included the determination of what intersections and roadways are to be analyzed, the scenarios to be analyzed and the methods required for analysis. The criteria for each of these parameters are included herein.

### 2.1 Study Area Criteria

The project study area was based on the County of Imperial Department of Public Works *Traffic Study and Report Policy* dated March 12, 2007, revised June 29, 2007 and approved by the Board of Supervisors of the County of Imperial on August 7, 2007. The following intersections were analyzed as part of this study:

- 1) Dunaway Road/Evan Hewes Highway (un-signalized)
- 2) Dunaway Road/Project Access (currently does not exist)
- 3) Dunaway Road/I-8 WB Ramps (un-signalized)
- 4) Dunaway Road/I-8 EB Ramps (un-signalized)
- 5) Drew Road/I-8 WB Ramps (un-signalized)
- 6) Drew Road/I-8 EB Ramps (un-signalized)
- 7) Forrester Road/I-8 WB Ramps (un-signalized)
- 8) Forrester Road/I-8 EB Ramps (un-signalized)

The following roadway/highway segments were analyzed as part of this study:

- 1) Dunaway Road from I-8 to Evan Hewes Highway
- 2) Evan Hewes Highway from Dunaway Road to Drew Road

The following freeway segments were analyzed as part of this study:

- 1) I-8 from Dunaway Road to Drew Road
- 2) I-8 from Drew Road to Forrester Road
- 3) I-8 from Forrester Road to Imperial Avenue

### 2.2 Scenario Criteria

The number of scenarios to be analyzed is based on the methodology outlined in the County of Imperial Department of Public Works *Traffic Study and Report Policy* dated March 12, 2007, revised June 29, 2007 and approved by the Board of Supervisors of the County of Imperial on August 7, 2007. Excerpts from the *Traffic Study and Report Policy* showing the scenario criteria are included in **Appendix A**. Based on the aforementioned methodology source, the following scenarios were analyzed:

- 1) Existing Conditions
- 2) Opening Year (2012) without and with Project Conditions
- 3) Opening Year (2012) + Cumulative (New Development) Conditions
- 4) Opening Year (2012) + Cumulative (New Development) + Project Conditions
- 5) Horizon Year (2030) + Project Conditions

## 2.3 Traffic Analysis Criteria

In the traffic analyses prepared for this study, the *2000 Highway Capacity Manual* (HCM) operations analysis using Level of Service (LOS) evaluation criteria were employed. The operating conditions of the study intersections are measured using the HCM LOS designations ranging from A through F. LOS A represents the best operating condition and LOS F denotes the worst operating condition. The individual LOS criteria for each roadway component are described below.

### 2.3.1 Intersections

The study intersections were analyzed using the **operational analysis** method outlined in the 2000 HCM. This process defines LOS in terms of **average control delay** (measured in seconds) per vehicle. Intersection LOS was calculated using the Synchro 7.0 (Trafficware Corporation, 2003) computer software program. The HCM LOS for the range of delay by seconds for un-signalized and signalized intersections is described in **Table 1**.

**TABLE 1: UN-SIGNALIZED AND SIGNALIZED INTERSECTION LEVEL OF SERVICE (HCM 2000)**

Level of Service	Un-Signalized	Signalized
	Average Control Delay (seconds/vehicle)	Average Control Delay (seconds/vehicle)
A	0-10	0-10
B	> 10-15	> 10-20
C	> 15-25	> 20-35
D	> 25-35	> 35-55
E	> 35-50	> 55-80
F	> 50	> 80

Source: Highway Capacity Manual 2000.

As noted on page 5 of Caltrans' *Guide for the Preparation of Traffic Impact Studies*, December 2002, the accepted methodology by Caltrans for un-signalized intersections is the most current edition of the HCM (excerpt included in **Appendix B**). Therefore, all of the study interchanges with un-signalized intersections were analyzed using the most current edition of the HCM.

### 2.3.2 Roadway Segments

The roadway segments were analyzed based on the functional classification of the roadway using the Imperial County Standard Street Classification capacity lookup table (copy included in **Appendix C**). The roadway segment capacity and LOS standards used to analyze roadway segments are summarized in **Table 2**.

**TABLE 2: ROADWAY SEGMENT DAILY CAPACITY AND LOS (IMPERIAL COUNTY)**

Circulation Element Road Classification	CROSS SECTION	LOS A	LOS B	LOS C	LOS D	LOS E
Expressway	154/210	<30,000	<42,000	<60,000	<70,000	<80,000
Prime Arterial	106/136	<22,200	<37,000	<44,600	<50,000	<57,000
Minor Arterial	82/102	<14,800	<24,700	<29,600	<33,400	<37,000
Major Collector (Collector)	64/84	<13,700	<22,800	<27,400	<30,800	<34,200
Minor Collector (Local Collector)	40/70	<1,900	<4,100	<7,100	<10,900	<16,200
Local County (Residential)	40/60	*	*	<1,500	*	*
Local County (Residential Cul-de-Sac or Loop Street)	40/60	*	*	<200	*	*
Major Industrial Collector – (Industrial)	76/96	<5,000	<10,000	<14,000	<17,000	<20,000
Industrial Local	44/64	<2,500	<5,000	<7,000	<8,500	<10,000

Source: Imperial County Department of Planning & Development Services *Circulation and Scenic Highways Element* January 29, 2008. Notes: \*Levels of service are not applied to residential streets since their primary purpose is to serve abutting lots, not carry through traffic. Levels of service normally apply to roads carrying through traffic between major trip generators and attractors.

### 2.3.3 Freeway Segments

The freeway segments were analyzed based on a multilane highway LOS criteria using a Volume to Capacity (V/C) ratio as outlined in the 2000 HCM. The accepted methodology by Caltrans for the analysis of freeway sections is to use the most current edition of the HCM as noted on page 5 of Caltrans' *Guide for the Preparation of Traffic Impact Studies*, December 2002. The freeway LOS operations are based on Caltrans' *Guide for the Preparation of Traffic Impact Studies* V/C ratios as summarized below in **Table 3**. Excerpts from Caltrans' *Guide for the Preparation of Traffic Impact Studies* are included in **Appendix D**.

**TABLE 3: FREEWAY LEVEL OF SERVICE**

Measure of Effectiveness	LOS A	LOS B	LOS C	LOS D	LOS E
Max Volume/Capacity Ratio	0.30	0.50	0.71	0.89	1.00

Source: Caltrans' *Guide for the Preparation of Traffic Impact Studies*, December 2002.

## 2.4 Significance Criteria

The significance criteria for traffic impacts are based on the Imperial County Planning & Development Services Department level of service standard as outlined on page 55 of the *Circulation and Scenic Highways Element* dated January 29, 2008, which states "The County's goal for an acceptable traffic service standard on an ADT basis and during AM and PM peak periods for all County-Maintained Roads shall be LOS C for all street segment links and intersections." An excerpt from the *Circulation and Scenic Highways Element* is included in **Appendix E**. The current practice of determining direct or cumulative impacts is defined by the significance criteria outlined in **Table 4** that was obtained from several current EIRs within the Imperial County area. The criteria outlined in Table 5 were confirmed per conversation with Mr. Neil Jorgenson, P.E. (Traffic Engineer for the County of Imperial Department of Public Works) on June 12, 2007. Copies of traffic significance criteria from two other EIRs are included in **Appendix F**.



**TABLE 4: SIGNIFICANCE CRITERIA**

Existing	Existing + Project	Existing + Project + Cumulative Projects	Impact Type
<b>Intersections</b>			
LOS C or better	LOS C or better	LOS C or better	None
LOS C or better	LOS D or worse	NA	Direct
LOS D	LOS D and adds 2.0 seconds or more of delay	LOS D or worse	Cumulative
LOS D	LOS E or F	NA	Direct
LOS E	LOS F	NA	Direct
LOS F	LOS F and delay increases by $\geq 10.0$ seconds	LOS F	Direct
Any LOS	Project does not degrade LOS and adds $< 2.0$ seconds of delay	Any LOS	None
Any LOS	Project does not degrade LOS but adds 2.0 to 9.9 seconds of delay	LOS E or worse	Cumulative
<b>Segments</b>			
LOS C or better	LOS C or better	LOS C or better	None
LOS C or better	LOS C or better and $v/c > 0.02$	LOS D or worse	Cumulative
LOS C or better	LOS D or worse	NA	Direct (1)
LOS D	LOS D and $v/c > 0.02$	LOS D or worse	Cumulative
LOS D	LOS E or F	NA	Direct
LOS E	LOS F	NA	Direct
LOS F	LOS F and $v/c$ increases by $> 0.09$	LOS F	Direct
Any LOS	LOS E or worse & $v/c$ 0.02 to 0.09	LOS E or worse	Cumulative
Any LOS	LOS E or worse and $v/c < 0.02$	Any LOS	None

Notes: LOS: Level of Service. (1) Exception: post-project segment operation is LOS D and intersections along segment are LOS D or better resulting in no significant impact. NA: Not Applicable.

## 2.5 Study Limitations

The findings and recommendations of this report were prepared in accordance with generally accepted professional traffic and transportation engineering principles and practice. No other warranty, express or implied is made.

## 3.0 Existing Conditions

This section describes the study area street system, peak hour intersection volumes, daily roadway volumes, and existing LOS.

### 3.1 Existing Street System

The existing roadway system and classifications are described below. These are based on the Imperial County Planning & Development Services Department *Circulation and Scenic Highways Element*, January 29, 2008 – excerpts included in **Appendix G**.

Interstate 8 (I-8) between Dunaway Road and Imperial Avenue is constructed as a 4 lane divided roadway with 2 lanes in each direction.

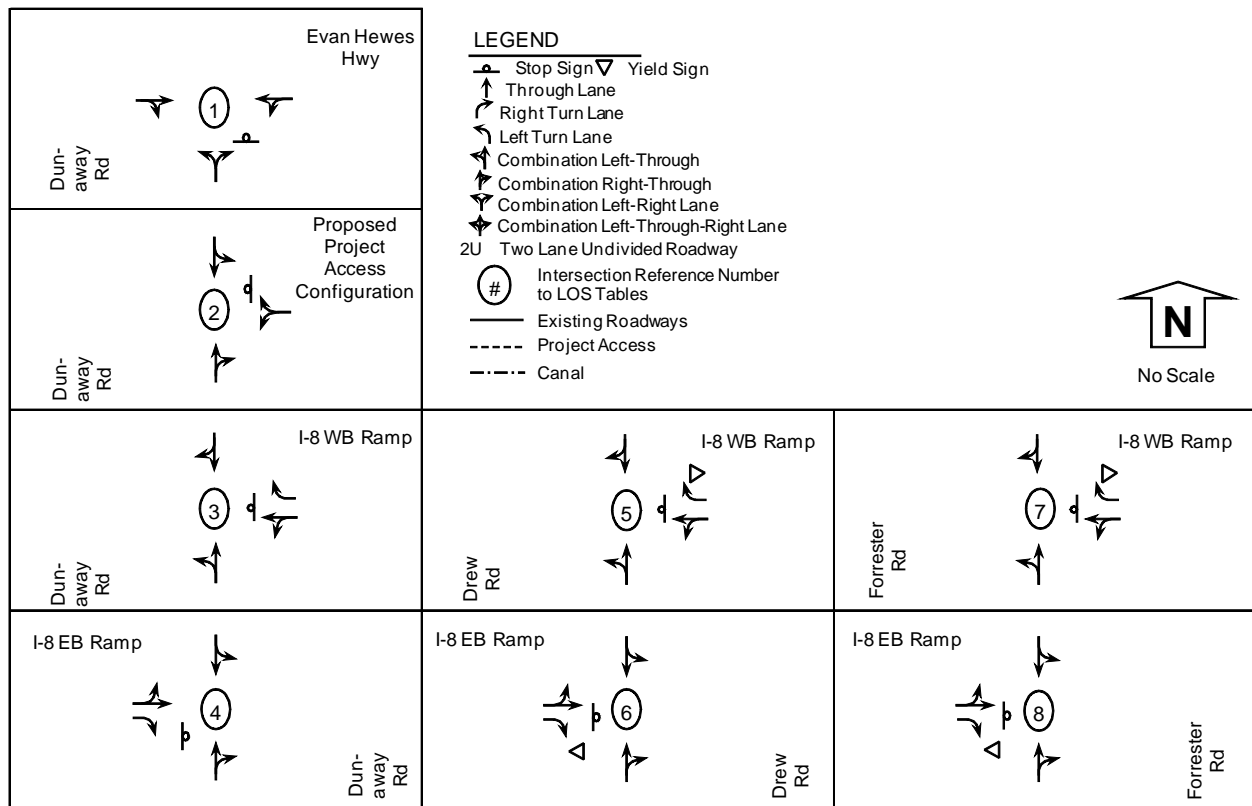
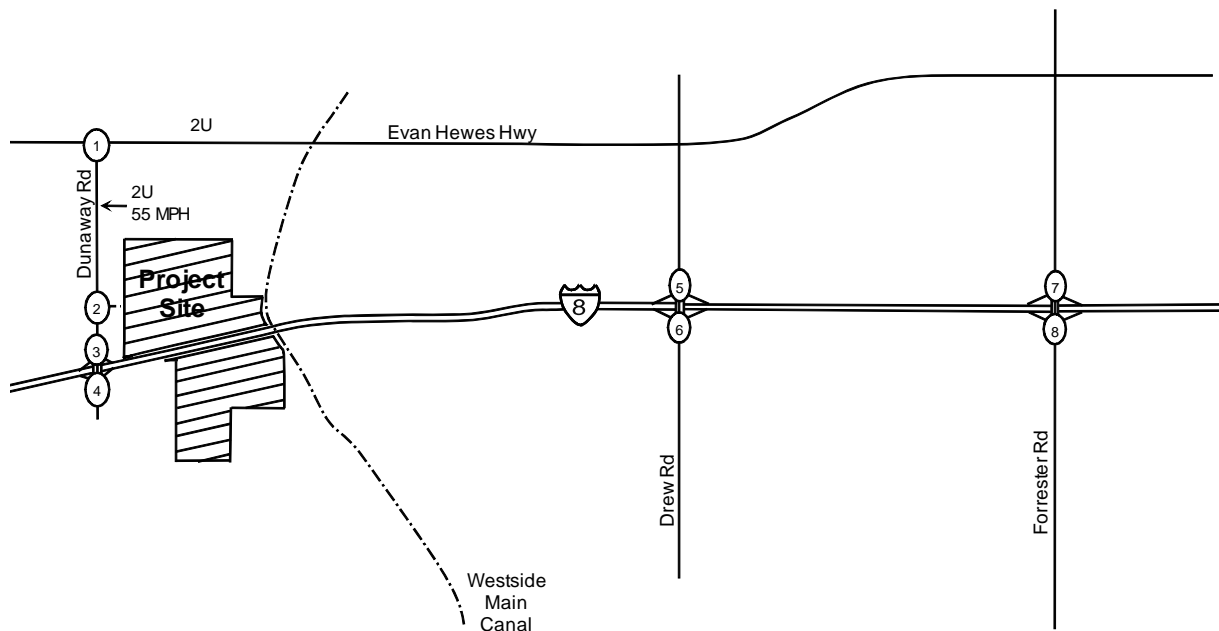
Dunaway Road between Evans Hewes Highway and I-8 has a classification of Major Collector in the *Imperial County Circulation Element Plan*. This roadway is currently constructed as a 2 lane un-divided roadway within approximately 30 feet of pavement. The posted speed limit is 55 MPH.

Evan Hewes Highway between Dunaway Road and Drew Road has a classification of Prime Arterial in the *Imperial County Circulation Element Plan*. This roadway is currently constructed as a 2 lane un-divided roadway within approximately 30 feet of pavement. A posted speed limit was not observed on Evan Hewes Highway along this segment.

The existing roadway conditions are shown in **Figure 3**.



**Figure 3: Existing Roadway Conditions**



## 3.2 Existing Traffic Volumes and LOS Analyses

Existing AM and PM peak hour intersection volumes (with count dates) were collected for this study (please note that portions of Drew Road around I-8 were closed due to seismic activity, thus available 2008 counts were factored up to represent year 2010):

- 1) Dunaway Road/Evan Hewes Highway (Thursday 6/3/2010)
- 2) Dunaway Road/Project Access (currently does not exist)
- 3) Dunaway Road/I-8 WB Ramps (Thursday 6/3/2010)
- 4) Dunaway Road/I-8 EB Ramps (Thursday 6/3/2010)
- 5) Drew Road/I-8 WB Ramps (Thursday 3/20/2008, with a 2.8% annual growth factor applied to reach a year 2010 equivalent)
- 6) Drew Road/I-8 EB Ramps (Thursday 3/20/2008, with a 2.8% annual growth factor applied to reach a year 2010 equivalent)
- 7) Forrester Road/I-8 WB Ramps (Thursday 6/3/2010)
- 8) Forrester Road/I-8 EB Ramps (Thursday 6/3/2010)

Daily traffic volumes (with count dates) were obtained or collected for the following segments:

- 1) Dunaway Road from I-8 to Evan Hewes Highway (Thursday 6/3/2010)
- 2) Evan Hewes Highway from Dunaway Road to Drew Road (Thursday 6/3/2010)

Daily freeway volumes (with count dates) were obtained for the following segments:

- 1) I-8 from Dunaway Road to Drew Road (Caltrans 2008 AADT – latest available)
- 2) I-8 from Drew Road to Forrester Road (Caltrans 2008 AADT – latest available)
- 3) I-8 from Forrester Road to Imperial Avenue (Caltrans 2008 AADT – latest available)

Existing AM, PM, and daily volumes are shown on **Figure 4** with count data included in **Appendix H**. The weekday intersection, segment, and freeway LOS are shown in **Tables 5, 6, and 7** respectively. Intersections LOS calculations are included in **Appendix I**.

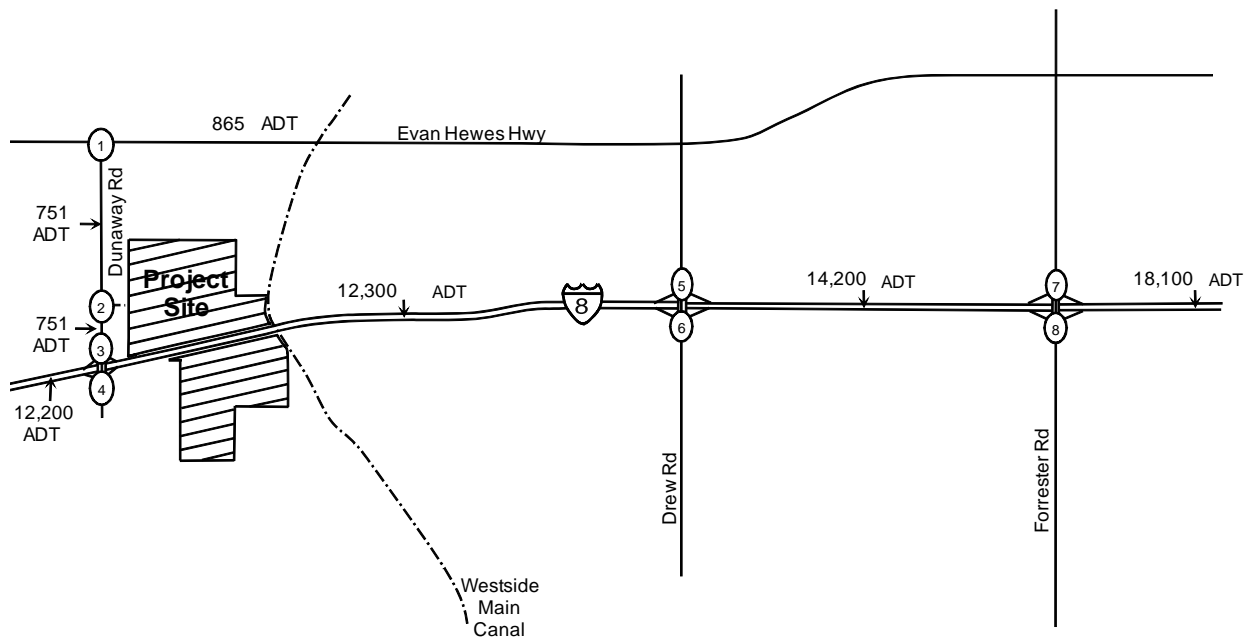
**TABLE 5: EXISTING INTERSECTION LOS**

Intersection & (Control) <sup>1</sup>	Movement	Peak Hour	Existing	
			Delay <sup>2</sup>	LOS <sup>3</sup>
1) Dunaway Rd at Evan Hewes Hwy (U)	NB LR	AM	8.8	A
	NB LR	PM	8.6	A
2) Dunaway Rd at Project Access (U)	WB LR	AM	Does not Exist	Does not Exist
	WB LR	PM		
3) Dunaway Rd at I-8 WB Ramp (U)	WB LR	AM	8.5	A
	WB LR	PM	8.7	A
4) Dunaway Rd at I-8 EB Ramp (U)	EB LR	AM	8.9	A
	EB LR	PM	8.7	A
5) Drew Rd at I-8 WB Ramp (U)	WB LR	AM	9.2	A
	WB LR	PM	9.0	A
6) Drew Rd at I-8 EB Ramp (U)	EB LR	AM	9.6	A
	EB LR	PM	10.8	B
7) Forrester Rd at I-8 WB Ramp (U)	WB LR	AM	9.7	A
	WB LR	PM	9.7	A
8) Forrester Rd at I-8 EB Ramp (U)	EB LR	AM	12.4	B
	EB LR	PM	16.7	C

Notes: 1) Intersection Control - (S) Signalized, (U) Unsignalized. 2) Delay - HCM Average Control Delay in seconds.

3) LOS: Level of Service.

**Figure 4: Existing Volumes**



<b>Evan Hewes Hwy</b> <div> <div> 12 (23) 2 Dun- away Rd </div> <div> <div> 1  <div> 25 (2) </div> </div> <div> 28 (10) 8 (24) </div> </div> </div>		<div> <div> 15 (38) 0 Project Access </div> <div> <div> 2  <div> 48 (10) </div> </div> <div> 0 (0) 0 (0) </div> </div> </div>		<div> <div> 10 (20) 5 (18) I-8 WB Ramp </div> <div> <div> 31 (4) 0 (3) 2 (1) </div> </div> </div>		<div> <div> 11 (18) 95 (136) I-8 WB Ramp </div> <div> <div> 143 (55) 0 (0) 13 (19) </div> </div> </div>		<div> <div> 46 (56) 170 (249) I-8 WB Ramp </div> <div> <div> 215 (161) 1 (3) 18 (18) </div> </div> </div>	
<div> <div> 13 (6) 1 (0) 0 (3) </div> <div> <div> 3 (1) 8 (19) </div> </div> </div>		<div> <div> 5 (8) 0 (1) 3 (2) </div> <div> <div> 45 (57) 61 (103) </div> </div> </div>		<div> <div> 35 (54) 0 (0) 3 (1) </div> <div> <div> 42 (51) 146 (231) </div> </div> </div>		<div> <div> 37 (25) 22 (22) Drew Rd </div> </div>		<div> <div> 36 (30) 19 (18) Forrester Rd </div> </div>	

**LEGEND**

- XX AM peak hour volumes at intersections
- (YY) PM peak hour volumes at intersections
- Z,ZZZ ADT volumes shown along segments
- # Intersection Reference Number to LOS Tables
- Existing Roadways
- Project Access
- Canal



**TABLE 6: EXISTING SEGMENT LOS**

Segment	Classification (as built)	Existing				
		Daily Volume	# of lanes	LOS C Capacity	V/C	LOS
<b><u>Dunaway Road</u></b>						
I-8 to Project Access	Major Collector (2U)	751	2	7,100	0.11	A
Project Access to Evan Hewes Hwy	Major Collector (2U)	751	2	7,100	0.11	A
<b><u>Evan Hewes Hwy</u></b>						
Dunaway Road to Drew Rd	Prime Arterial (2U)	865	2	7,100	0.12	A

Notes: Classification based on 1/29/08 Circulation and Scenic Highways Element. 2U = 2 lane undivided roadway. Daily volume is a 24 hour volume. LOS: Level of Service. LOS based on actual number of lanes currently constructed. V/C: Volume to Capacity ratio.

**TABLE 7: EXISTING FREEWAY LOS**

Freeway Segment	I-8 Dunaway Rd to Drew Rd				I-8 Drew Rd to Forrester Rd				I-8 Forrester Rd to Imperial Ave			
Existing (Year 2008)	12,300				14,200				18,100			
ADT	A M		P M		A M		P M		A M		P M	
Peak Hour												
Direction	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB
Number of Lanes	2	2	2	2	2	2	2	2	2	2	2	2
Capacity (1)	4,700	4,700	4,700	4,700	4,700	4,700	4,700	4,700	4,700	4,700	4,700	4,700
K Factor (2)	0.1076	0.0963	0.0917	0.1517	0.1076	0.0963	0.0917	0.1517	0.1076	0.0963	0.0917	0.1517
D Factor (3)	0.2616	0.7384	0.4419	0.5581	0.2616	0.7384	0.4419	0.5581	0.2616	0.7384	0.4419	0.5581
Truck Factor (4)	0.8376	0.8376	0.8376	0.8376	0.8376	0.8376	0.8376	0.8376	0.8376	0.8376	0.8376	0.8376
Peak Hour Volume	413	1,044	595	1,243	477	1,206	687	1,435	608	1,537	876	1,830
Volume to Capacity	0.088	0.222	0.127	0.265	0.102	0.256	0.146	0.305	0.129	0.327	0.186	0.389
LOS	A	A	A	A	A	A	A	B	A	B	A	B

Notes: (1) Capacity of 2,350 pcphpl from CALTRANS' Guide for the Preparation of Traffic Impact Studies, December 2002. (2) Latest K factor from Caltrans (based on 2009 report), which is the percentage of AADT in both directions. (3) Latest D factor from Caltrans (based on 2009 report), which when multiplied by K and ADT will provide peak hour volume. (4) Latest truck factor from Caltrans (based on 2008 report).

Under existing year 2010 conditions, the study roadways were calculated to operate at LOS C or better.

## 4.0 Project Description

The project is a photovoltaic solar facility capable of producing approximately 250 megawatts of electricity on approximately 1,130 acres of previously disturbed agricultural land. The project is generally located east of Dunaway Road and bisected by I-8.

### 4.1 Project Trip Generation

The project trip generation consists of a construction phase and operations phase. The construction phase will have the highest intensity followed by an operations phase with significantly fewer trips. This section describes the construction and operations trip generation.

#### 4.1.1 Construction Trip Generation

Construction of the project includes site preparation, foundation construction, erection of major equipment and structures, installation of electrical systems, control systems, and start-up/testing. These construction activities are expected to require approximately 17 months. According to the applicant, the construction workforce is expected to reach a peak of approximately 285 workers with hours generally between 7am and 3pm Monday through Friday. Additionally, equipment deliveries and construction trucks will serve the project site. The highest construction phase of the project is calculated to generate 750 ADT with 306 AM peak hour trips (300 inbound and 6 outbound) and 315 PM peak hour trips (15 inbound and 300 outbound) as shown in **Table 8**.

**TABLE 8: PROJECT TRIP GENERATION SUMMARY**

Proposed Construction Related Traffic	ADT	AM		PM	
		IN (7am)	OUT (7am)	IN (3pm)	OUT (3pm)
Peak Construction Workers <sup>1</sup>	570	285	0	0	285
Equipment Deliveries and Construction Truck Trips (with PCE) <sup>2</sup>	180	15	6	15	15
Total Traffic During Peak Construction Period	<b>750</b>	<b>300</b>	<b>6</b>	<b>15</b>	<b>300</b>

Notes: 1) Number of construction workers estimated by applicant. 2) Passenger Car Equivalent (PCE) factor of 3 applied to each truck; therefore, 180 ADT equals 30 daily trucks. Number of trucks based on another power station project with similar number of construction workers.

#### 4.1.2 Project Operations and Maintenance Trip Generation

According to the applicant, the project will primarily operate during daylight hours and will require approximately 4 fulltime personnel for operations and maintenance. The project site will be staffed with a security guard 24 hours per day, seven days per week. Based on this information, the operations and maintenance trip generation is estimated at 10 to 15 ADT with 4 AM and 4 PM peak hour trips. Therefore, the higher and more conservative construction trip generation is used to determine potential project impacts.

## 4.2 Project Construction Opening Day

According to the applicant, the construction phase is planned to take 17 months and would begin in September 2011. This would place the construction phase from September 2011 through January 2013. The midpoint of the construction would occur around the summer of 2012 or approximately 24 months from the preparation of this analysis. Therefore, the construction phase opening day is taken as year 2012.

The opening year background volumes are based on increasing the existing year 2010 volumes by an annual growth rate. Determination of the annual growth rate was based on guidelines defined in the County of Imperial Department of Public Works *Traffic Study and Report Policy* dated March 12, 2007, revised June 29, 2007 and approved by the Board of Supervisors of the County of Imperial on August 7, 2007. This document indicates that traffic projections should be based on demonstrated growth as detailed in the general plan. Three growth rate options were reviewed:

- 1) The Land Use Element of the general plan indicates that the Population Research Unit of the California Department of Finance (DOF) estimates the annual change in population. Using the DOF revised July 1, 2006 population estimate of 168,979 and the projected population of Imperial County in 2030 of 283,693, an annual growth rate of 2.2 percent is calculated.
- 2) The Housing Element section of the general plan has a 1980 population of 92,500. The 2000 Southern California Association of Governments [SCAG] population estimate of 148,980 for the year 2000. Based on this information, an annual growth rate of 2.4 percent is calculated.
- 3) The Southern California Association of Governments Community Development Division's 2004 *Regional Transportation Plan Socio-Economic Forecast Report*, dated June 2004, states that the population of Imperial County is projected to grow at an annual rate of 2.8 percent.

For the purpose of this traffic study, the more conservative growth rate of **2.8 percent** was selected for the annual population growth rate. The growth factor support data are included in **Appendix J**. Year 2012 volumes data was factored up from year 2010 data through the application of a 2.8% annual growth rate.

## 4.3 Construction Trip Distribution and Assignment (Drew Road Interchange Open)

The applicant has indicated that the labor pool for the project construction is anticipated to come primarily from within Imperial County and supplemented by specialists and or equipment from outside the valley. Local cities/residential communities within Imperial County are considered to include but are not limited to Calipatria, Westmorland, Brawley, Imperial, El Centro, Holtville, and Calexico. The distribution of the construction workforce by cities/communities was based on the concentration of populations per the Census 2000 from the U.S. Census Bureau. The percentage of local construction workforce by city/community and county is shown in **Table 9**.

**TABLE 9: CONSTRUCTION WORKFORCE SOURCES BASED ON CENSUS 2000 POPULATIONS (80% LOCAL)**

<b>80% LOCAL WORKFORCE</b>	<b>2000 Census Population</b>	<b>Percentage of Total</b>	<b>Percentage of Construction Employees (80% from within Imperial County)</b>
Calipatria	7,289	6%	5%
Westmorland	2,131	2%	2%
Brawley	22,052	20%	16%
Imperial	7,560	7%	5%
El Centro	37,835	35%	28%
Holtville	5,612	5%	4%
Calexico	27,109	25%	20%
<b>Total</b>	<b>109,588</b>	<b>100%</b>	<b>80%</b>

Source: Population data from U.S. Census Bureau.

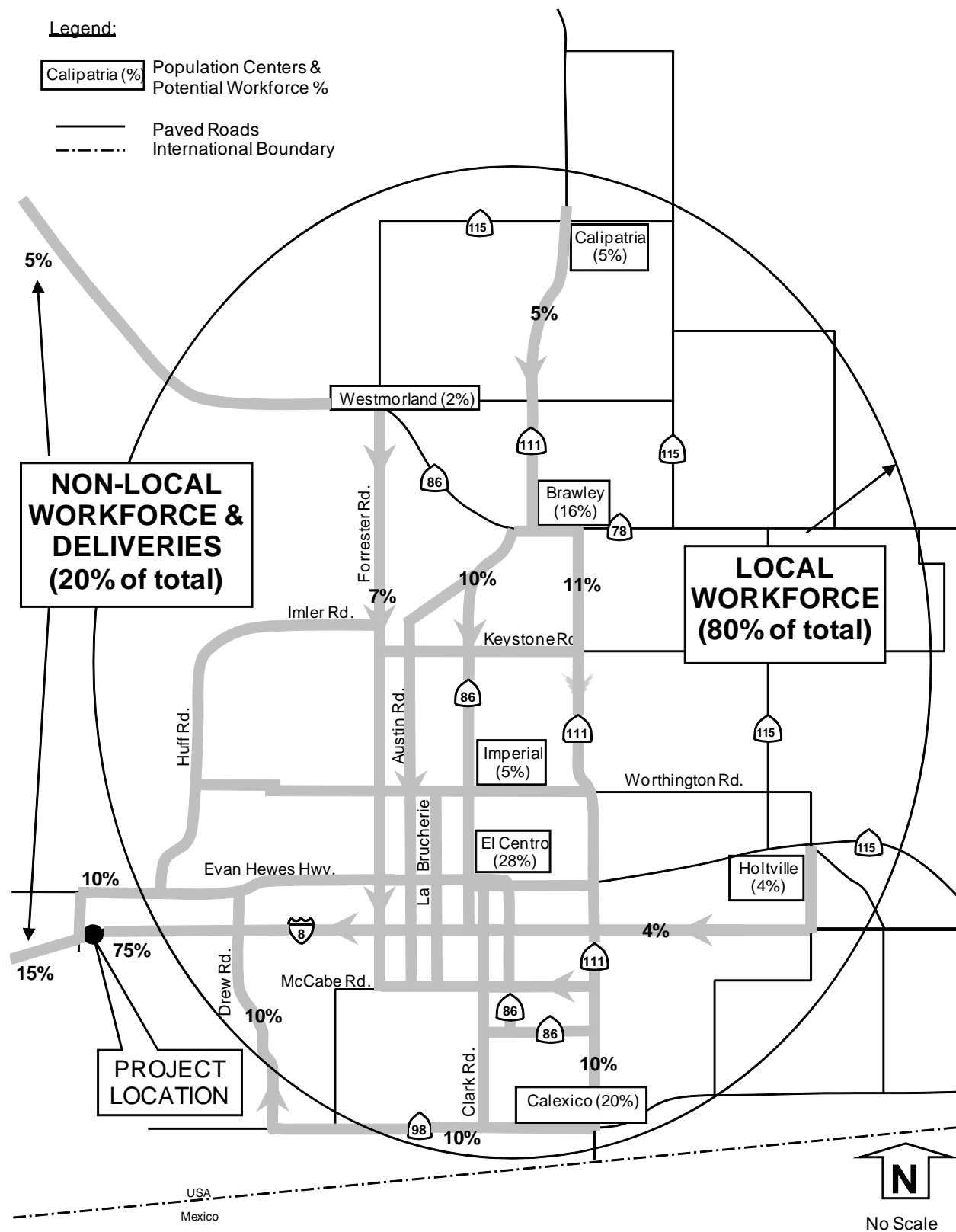
Based on the above information, the regional construction distribution is shown in **Figure 5** with the study area distribution shown in **Figure 6**. The trip assignment is shown in **Figure 7**.

#### **4.4 Construction Trip Distribution and Assignment (Drew Road Interchange Closed)**

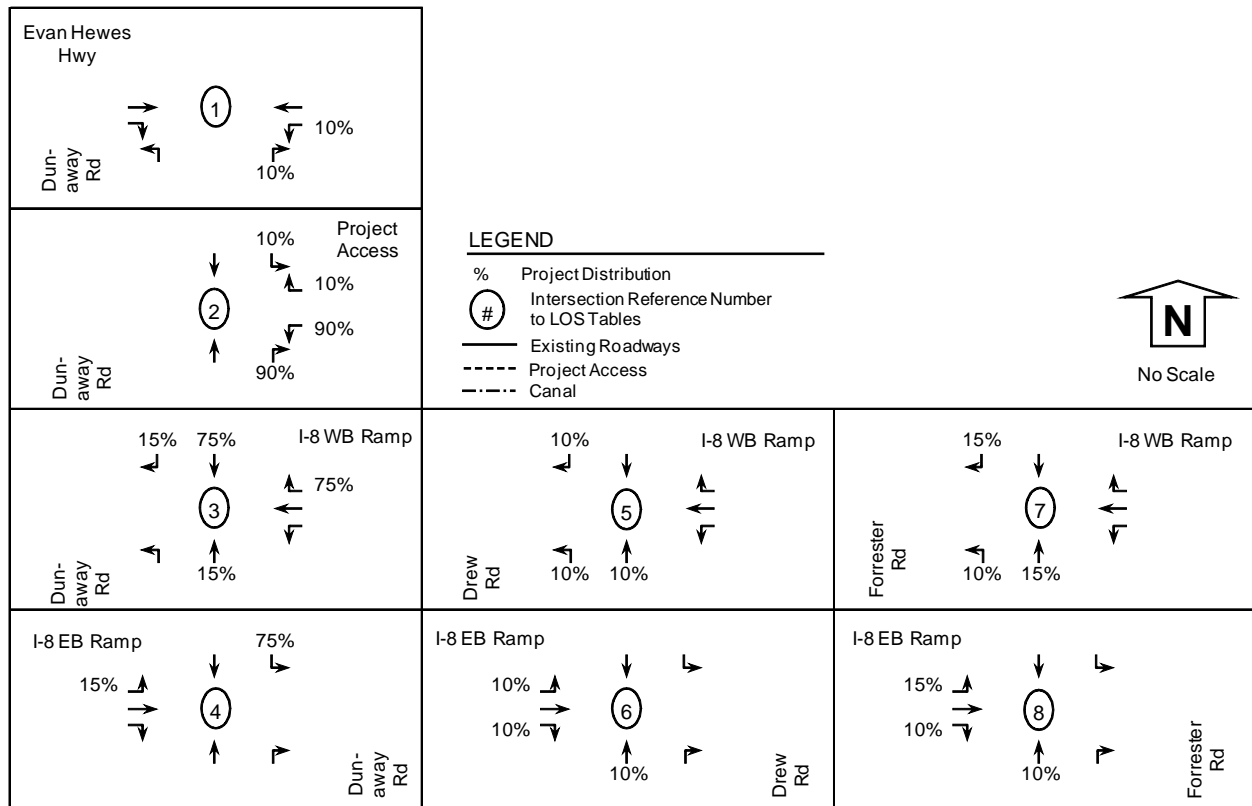
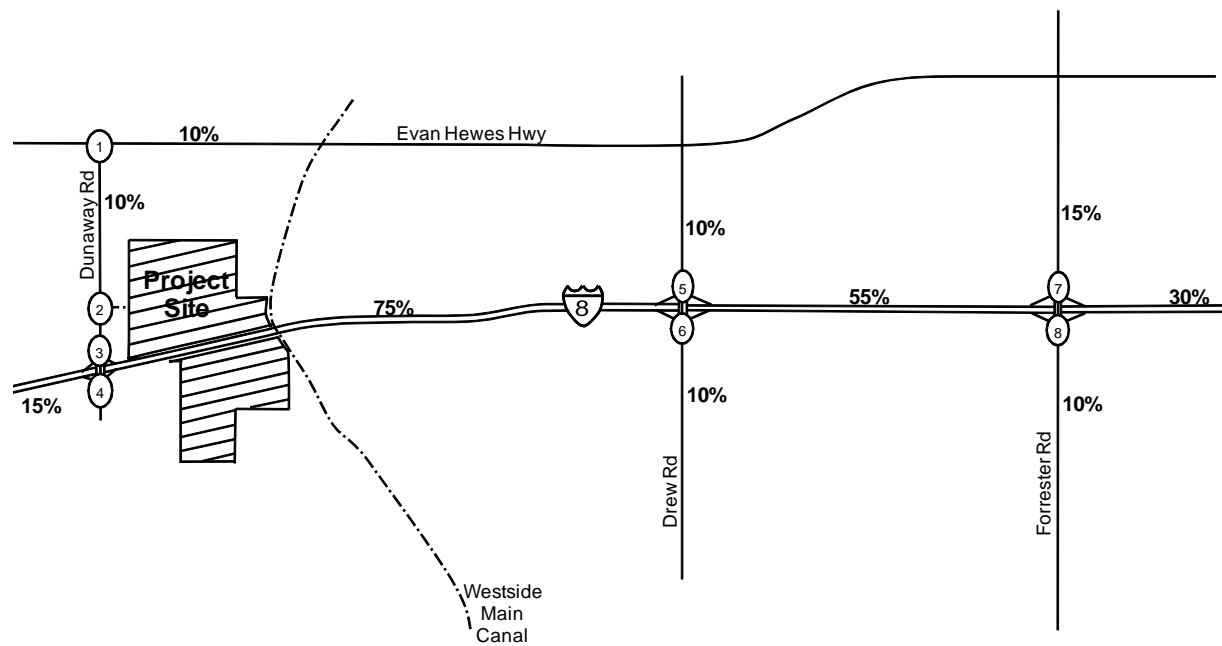
Due to recent seismic activity within Imperial Valley and neighboring areas, portions of Drew Road around the I-8 interchange have been closed. To account for these temporary closures, an alternative distribution is anticipated until Drew Road is repaired and opened. This alternative distribution is shown in **Figure 8** regionally and **Figure 9** for the study area. The trip assignment with the Drew Road interchange being temporarily closed is shown in **Figure 7**.



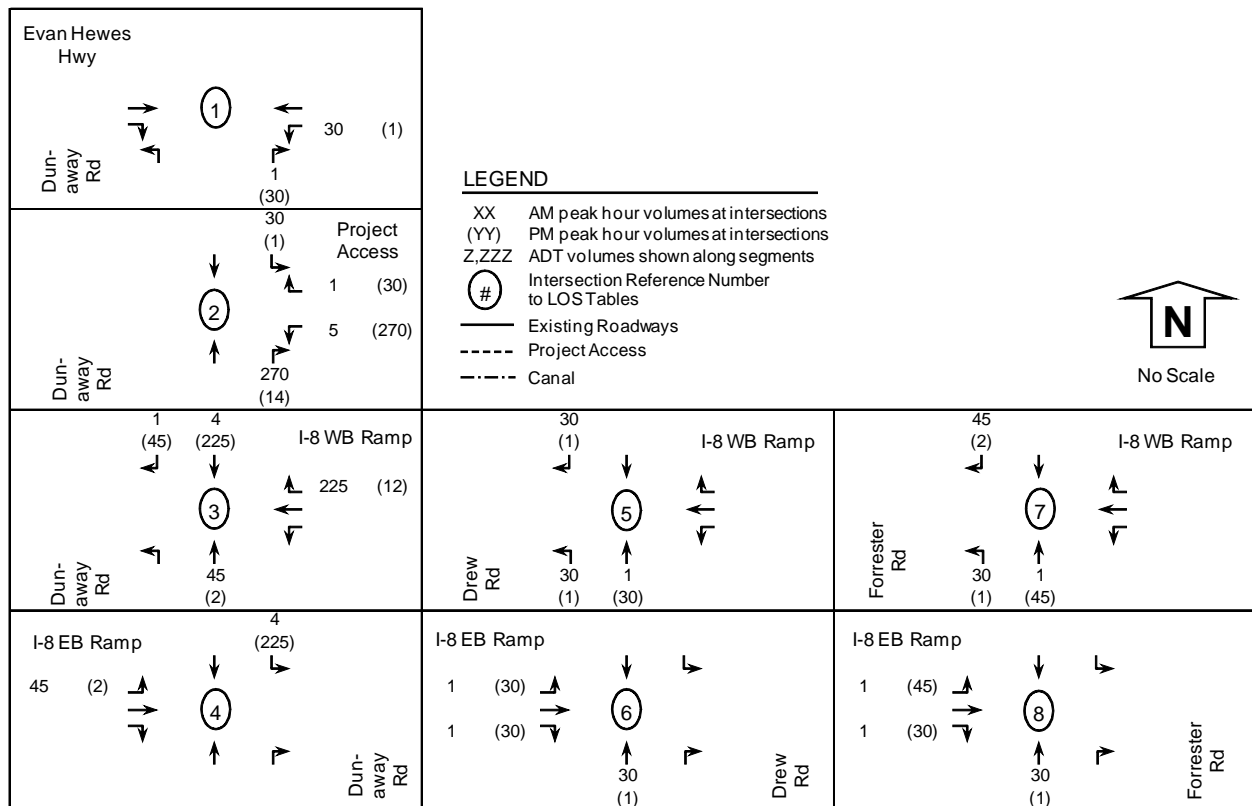
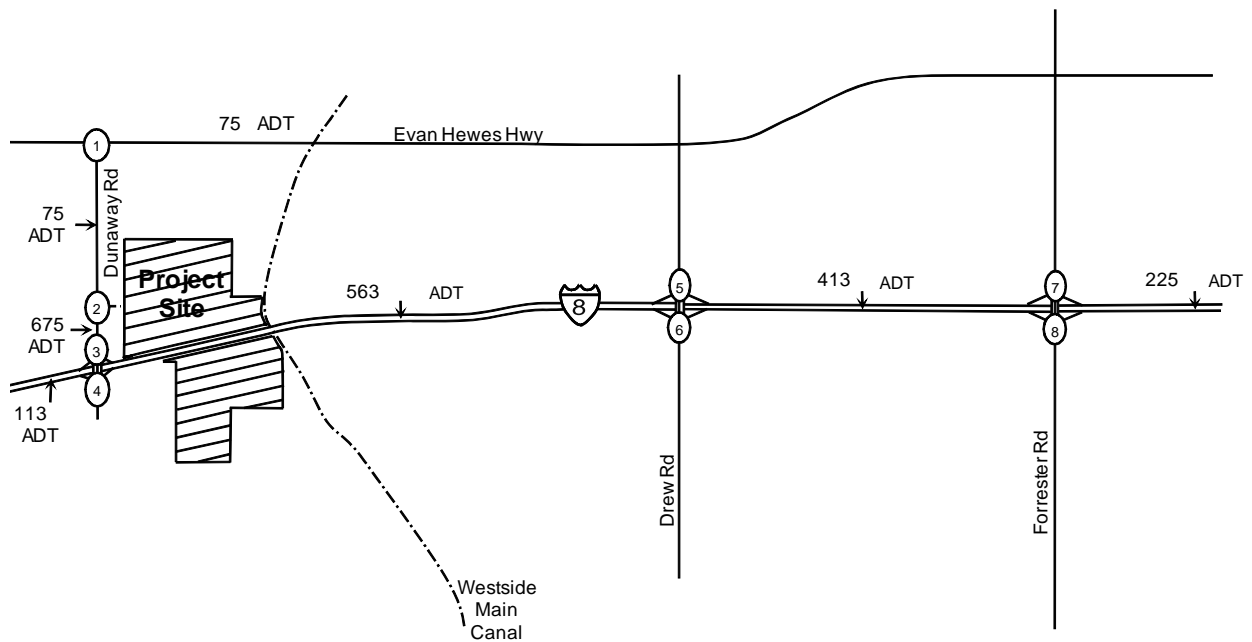
**Figure 5: Regional Construction Distribution (Drew Interchange Open)**



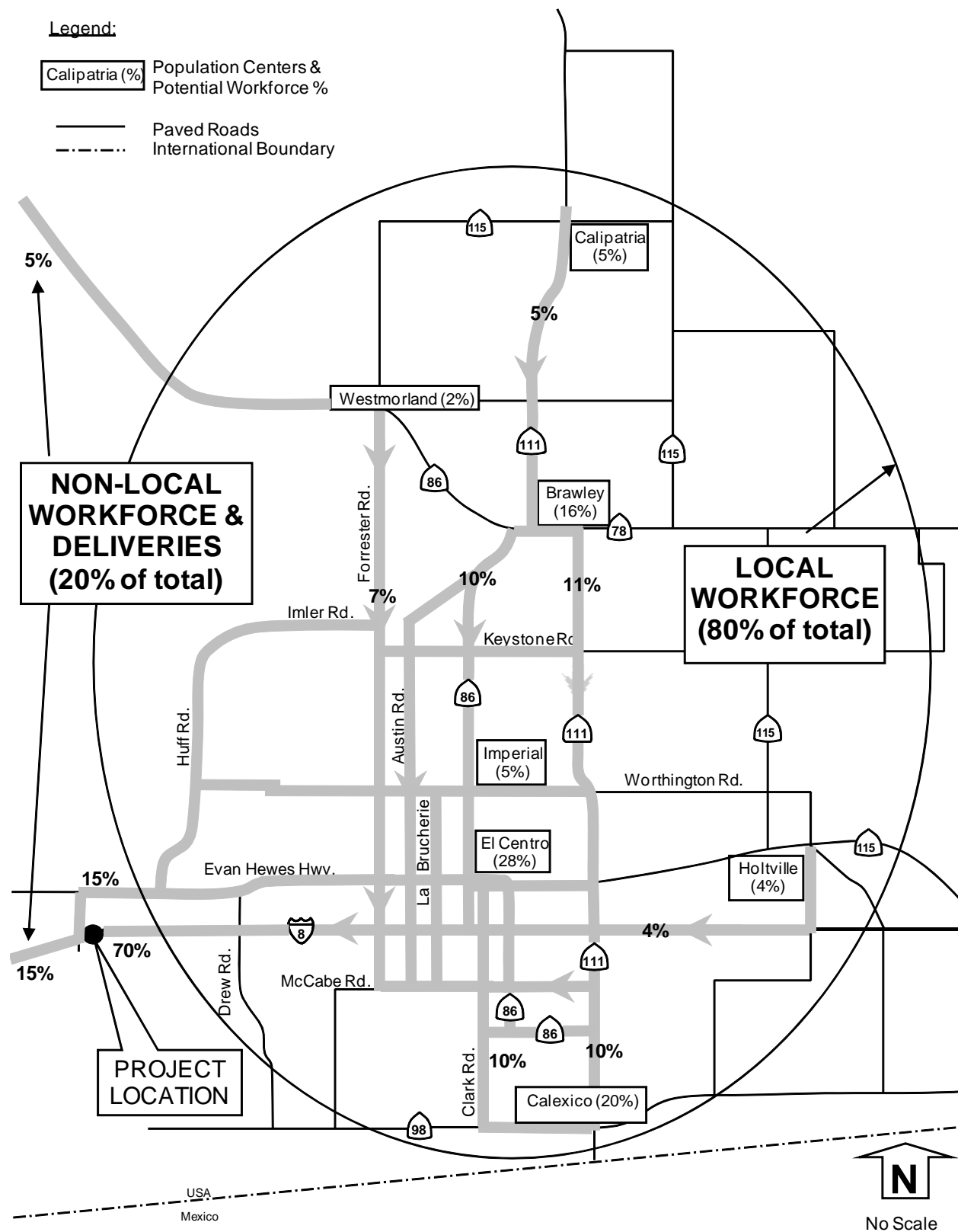
**Figure 6: Local Construction Distribution (Drew Interchange Open)**



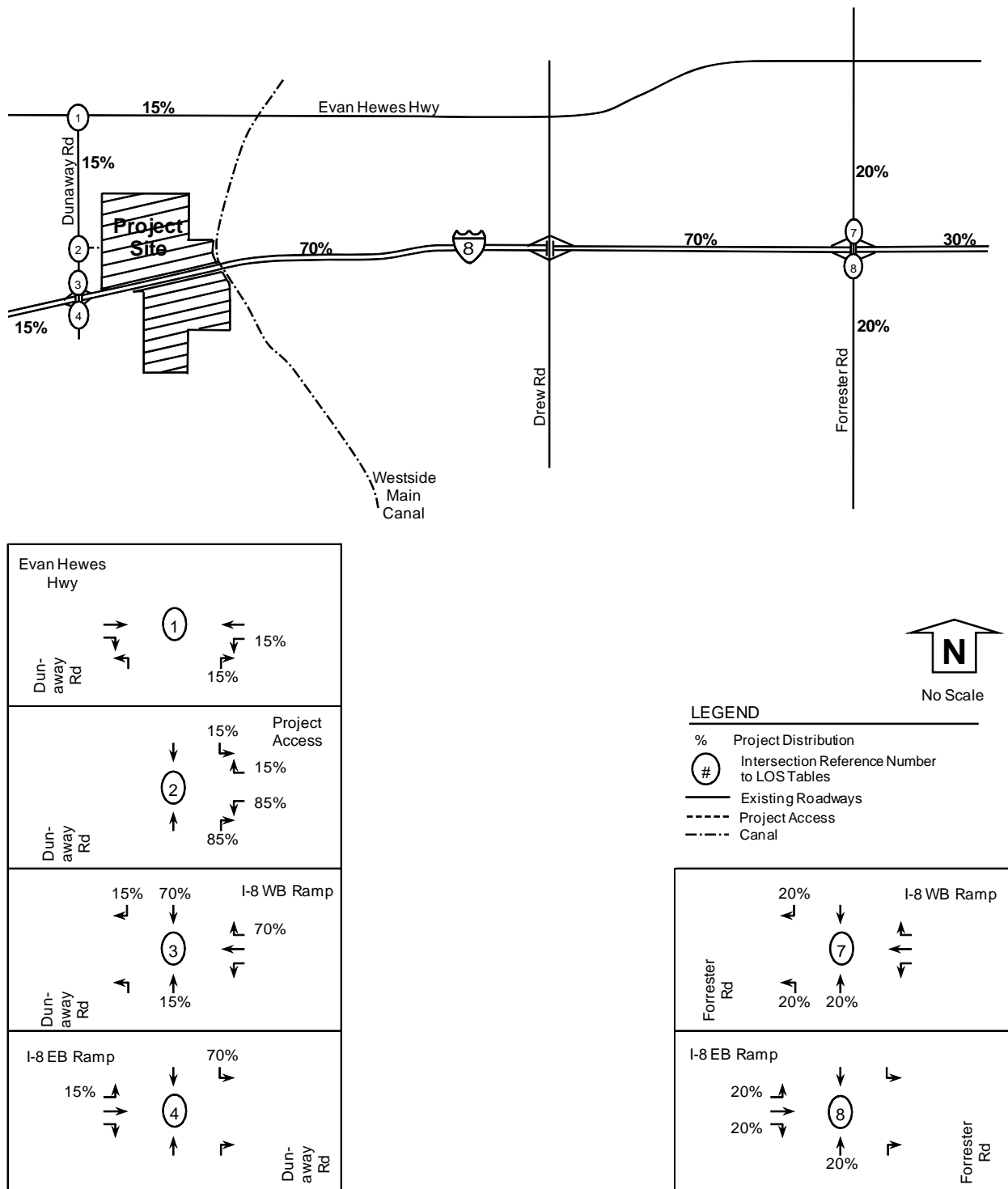
**Figure 7: Construction Trip Assignment (Drew Interchange Open)**



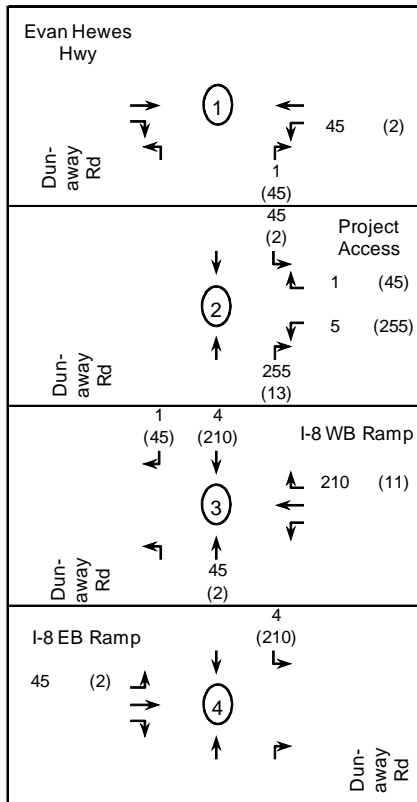
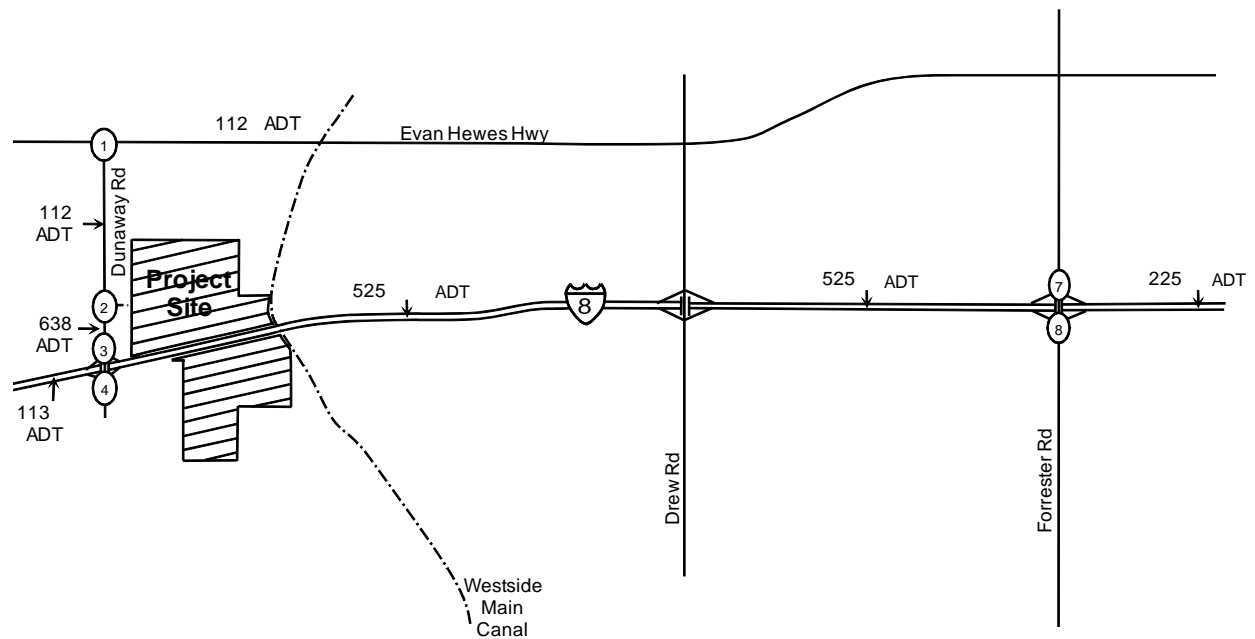
**Figure 8: Regional Construction Distribution (Drew Interchange Closed)**



**Figure 9: Local Construction Distribution (Drew Interchange Closed)**

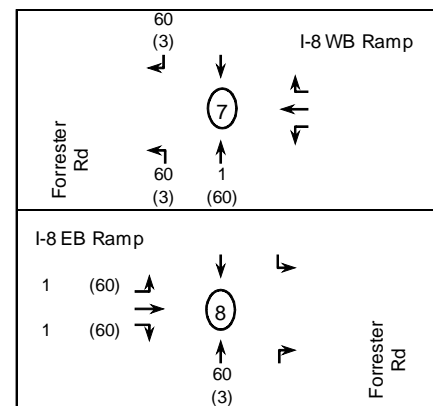


**Figure 10: Construction Trip Assignment (Drew Interchange Closed)**



**LEGEND**

- XX AM peak hour volumes at intersections
- (YY) PM peak hour volumes at intersections
- Z,ZZZ ADT volumes shown along segments
- Ⓢ Intersection Reference Number to LOS Tables
- Existing Roadways
- - - Project Access
- . - . - Canal



## 5.0 Year (2012) Conditions

This section documents year 2012 conditions when the project is anticipated to be at the peak and midpoint of construction activities. Background year 2012 volumes were calculated by increasing year 2010 volumes by 5.6% as shown in **Figure 11**. Intersection, segment, and freeway LOS are shown in **Tables 10, 11 and 12**. Intersection LOS calculations are included in **Appendix K**.

**TABLE 10: YEAR (2012) INTERSECTION LOS**

Intersection & (Control) <sup>1</sup>	Movement	Peak Hour	Year (2012)	
			Delay <sup>2</sup>	LOS <sup>3</sup>
1) Dunaway Rd at Evan Hewes Hwy (U)	NB LR	AM	8.8	A
	NB LR	PM	8.6	A
2) Dunaway Rd at Project Access (U)	WB LR	AM	Does not Exist	Does not Exist
	WB LR	PM	Does not Exist	Does not Exist
3) Dunaway Rd at I-8 WB Ramp (U)	WB LR	AM	8.5	A
	WB LR	PM	8.8	A
4) Dunaway Rd at I-8 EB Ramp (U)	EB LR	AM	8.9	A
	EB LR	PM	8.7	A
5) Drew Rd at I-8 WB Ramp (U)	WB LR	AM	9.2	A
	WB LR	PM	9.0	A
6) Drew Rd at I-8 EB Ramp (U)	EB LR	AM	9.7	A
	EB LR	PM	10.9	B
7) Forrester Rd at I-8 WB Ramp (U)	WB LR	AM	9.9	A
	WB LR	PM	9.8	A
8) Forrester Rd at I-8 EB Ramp (U)	EB LR	AM	12.7	B
	EB LR	PM	17.8	C

Notes: 1) Intersection Control - (S) Signalized, (U) Unsignalized. 2) Delay - HCM Average Control Delay in seconds.

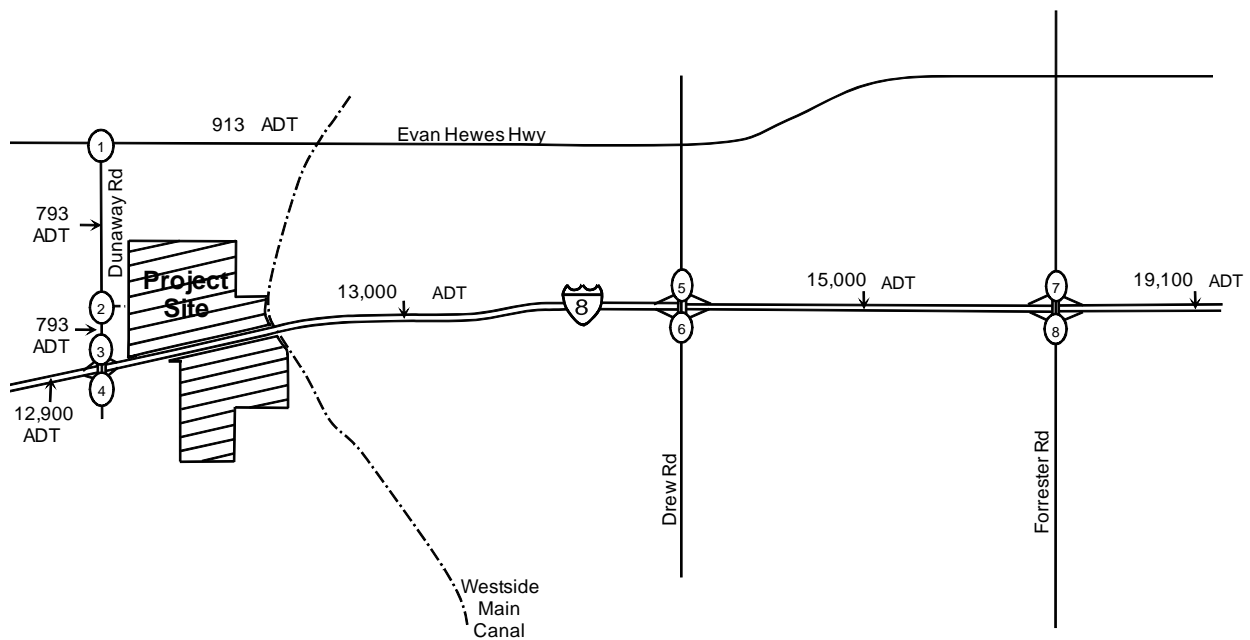
3) LOS: Level of Service.

**TABLE 11: YEAR (2012) SEGMENT LOS**

Segment	Classification (as built)	Year 2012				
		Daily Volume	# of lanes	LOS C Capacity	V/C	LOS
<b><u>Dunaway Road</u></b>						
I-8 to Project Access	Major Collector (2U)	793	2	7,100	0.11	A
Project Access to Evan Hewes Hwy	Major Collector (2U)	793	2	7,100	0.11	A
<b><u>Evan Hewes Hwy</u></b>						
Dunaway Road to Drew Rd	Prime Arterial (2U)	913	2	7,100	0.13	A

Notes: Classification based on 1/29/08 Circulation and Scenic Highways Element. 2U = 2 lane undivided roadway. Daily volume is a 24 hour volume. LOS: Level of Service. LOS based on actual number of lanes currently constructed. V/C: Volume to Capacity ratio.

**Figure 11: Year (2012) Volumes**



<div>Evan Hewes Hwy</div> <div><div><div>13 2</div><div>(24) (14)</div><div>→</div></div><div><div>1</div><div>←</div><div>30 8</div><div>(11) (25)</div></div><div><div>Dun-away Rd</div><div>26 (2)</div></div><div><div>24 (8)</div><div>↙</div></div></div>		<div>LEGEND</div> <div>XX AM peak hour volumes at intersections</div> <div>(YY) PM peak hour volumes at intersections</div> <div>Z,ZZZ ADT volumes shown along segments</div> <div><div>#</div>Intersection Reference Number to LOS Tables</div> <div>Existing Roadways</div> <div>Project Access</div> <div>Canal</div>		<div><div>↑</div><div>N</div><div>↓</div></div> <div>No Scale</div>	
<div><div><div>16 (40)</div><div>↓</div></div><div><div>2</div><div>↙</div><div>0 ( )</div></div><div><div>Dun-away Rd</div><div>51 (11)</div></div><div><div>0 ( )</div><div>↙</div></div><div>Project Access</div><div>0 ( )</div><div>0 ( )</div></div>					
<div><div><div>11 (21)</div><div>↙</div></div><div><div>5 (19)</div><div>↓</div></div><div><div>I-8 WB Ramp</div><div>33 0 2</div><div>(4) (3) (1)</div></div><div><div>Dun-away Rd</div><div>0 ( )</div></div><div><div>18 (6)</div><div>↑</div></div><div><div>3</div><div>↙</div><div>18 (6)</div></div></div>		<div><div><div>11 (19)</div><div>↙</div></div><div><div>100 (144)</div><div>↓</div></div><div><div>I-8 WB Ramp</div><div>151 0 13</div><div>(58) ( ) (20)</div></div><div><div>Drew Rd</div><div>2 (2)</div></div><div><div>41 (32)</div><div>↑</div></div><div><div>5</div><div>↙</div><div>41 (32)</div></div></div>		<div><div><div>49 (59)</div><div>↙</div></div><div><div>180 (263)</div><div>↓</div></div><div><div>I-8 WB Ramp</div><div>227 1 19</div><div>(170) (3) (19)</div></div><div><div>Forrester Rd</div><div>19 (16)</div></div><div><div>56 (69)</div><div>↑</div></div><div><div>7</div><div>↙</div><div>56 (69)</div></div></div>	
<div><div><div>3 (1)</div><div>↓</div></div><div><div>8 (20)</div><div>↙</div></div><div><div>I-8 EB Ramp</div><div>14 1 0</div><div>(6) ( ) (3)</div></div><div><div>Dun-away Rd</div><div>0 ( )</div></div><div><div>1 (6)</div><div>↙</div></div><div><div>4</div><div>↙</div><div>0 ( )</div></div></div>		<div><div><div>48 (60)</div><div>↓</div></div><div><div>65 (108)</div><div>↙</div></div><div><div>I-8 EB Ramp</div><div>6 0 3</div><div>(9) (1) (2)</div></div><div><div>Drew Rd</div><div>39 (27)</div></div><div><div>23 (23)</div><div>↙</div></div><div><div>6</div><div>↙</div><div>39 (27)</div></div></div>		<div><div><div>44 (54)</div><div>↓</div></div><div><div>154 (244)</div><div>↙</div></div><div><div>I-8 EB Ramp</div><div>37 0 3</div><div>(57) ( ) (1)</div></div><div><div>Forrester Rd</div><div>20 (19)</div></div><div><div>38 (32)</div><div>↑</div></div><div><div>8</div><div>↙</div><div>38 (32)</div></div></div>	

**TABLE 12: YEAR (2012) FREEWAY LOS**

Freeway Segment	I-8				I-8				I-8			
	Dunaway Rd to Drew Rd				Drew Rd to Forrester Rd				Forrester Rd to Imperial Ave			
Forecasted Year 2012												
ADT	13,000				15,000				19,100			
Peak Hour	A M		P M		A M		P M		A M		P M	
Direction	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB
Number of Lanes	2	2	2	2	2	2	2	2	2	2	2	2
Capacity (1)	4,700	4,700	4,700	4,700	4,700	4,700	4,700	4,700	4,700	4,700	4,700	4,700
K Factor (2)	0.1076	0.0963	0.0917	0.1517	0.1076	0.0963	0.0917	0.1517	0.1076	0.0963	0.0917	0.1517
D Factor (3)	0.2616	0.7384	0.4419	0.5581	0.2616	0.7384	0.4419	0.5581	0.2616	0.7384	0.4419	0.5581
Truck Factor (4)	0.8376	0.8376	0.8376	0.8376	0.8376	0.8376	0.8376	0.8376	0.8376	0.8376	0.8376	0.8376
Peak Hour Volume	437	1,104	629	1,314	504	1,273	726	1,516	642	1,621	924	1,931
Volume to Capacity	0.093	0.235	0.134	0.280	0.107	0.271	0.154	0.323	0.137	0.345	0.197	0.411
LOS	A	A	A	A	A	A	A	B	A	B	A	B

Notes: (1) Capacity of 2,350 pcphpl from CALTRANS' Guide for the Preparation of Traffic Impact Studies, December 2002. (2) Latest K factor from Caltrans (based on 2007 report), which is the percentage of AADT in both directions. (3) Latest D factor from Caltrans (based on 2007 report), which when multiplied by K and ADT will provide peak hour volume. (4) Latest truck factor from Caltrans (based on 2007 report).

Under year 2012 conditions, the study roadways were calculated to operate at LOS C or better.

## 6.0 Year (2012) + Project Conditions

This section documents the addition of construction traffic onto year 2012 conditions for the anticipated peak and midpoint of the project construction period. To account for the temporary closure of portions of Drew Road around the Interstate 8 interchange, two alternatives are analyzed: 1) the interchange at I-8 and Drew Road open, and 2) the interchange at I-8 and Drew Road closed.

### 6.1 Year (2012) + Project with Drew Interchange Open

This scenario documents the anticipated project traffic added onto the year 2012 conditions with Drew Road around I-8 open for travel. Year 2012 plus project construction volumes are shown in **Figure 12**. Intersection, segment, and freeway LOS are shown in **Tables 13, 14 and 15**. Intersection LOS calculations are included in **Appendix L**.

**TABLE 13: YEAR (2012) W/O & WITH PROJECT INTERSECTION LOS (DREW INTERCHANGE OPEN)**

Intersection & (Control) <sup>1</sup>	Movement	Year (2012)		Year (2012) + Project			
		Delay <sup>2</sup>	LOS <sup>3</sup>	Delay <sup>2</sup>	LOS <sup>3</sup>	Delta <sup>4</sup>	Impact <sup>5</sup>
1) Dunaway Rd at	NB LR	8.8	A	9.1	A	0.3	No
Evan Hewes Hwy (U)	NB LR	8.6	A	8.6	B	0.0	No
2) Dunaway Rd at	WB LR	Does not	Does not	10.1	B	NA	No
Project Access (U)	WB LR	Exist	Exist	10.8	B	NA	No
3) Dunaway Rd at	WB LR	8.5	A	10.0	B	1.5	No
I-8 WB Ramp (U)	WB LR	8.8	A	8.9	A	0.1	No
4) Dunaway Rd at	EB LR	8.9	A	9.0	A	0.1	No
I-8 EB Ramp (U)	EB LR	8.7	A	12.6	B	3.9	No
5) Drew Rd at	WB LR	9.2	A	9.3	A	0.1	No
I-8 WB Ramp (U)	WB LR	9.0	A	9.2	A	0.2	No
6) Drew Rd at	EB LR	9.7	A	9.9	A	0.2	No
I-8 EB Ramp (U)	EB LR	10.9	B	11.1	B	0.2	No
7) Forrester Rd at	WB LR	9.9	A	9.9	A	0.0	No
I-8 WB Ramp (U)	WB LR	9.8	A	10.2	B	0.4	No
8) Forrester Rd at	EB LR	12.7	B	13.1	B	0.4	No
I-8 EB Ramp (U)	EB LR	17.8	C	17.9	C	0.1	No

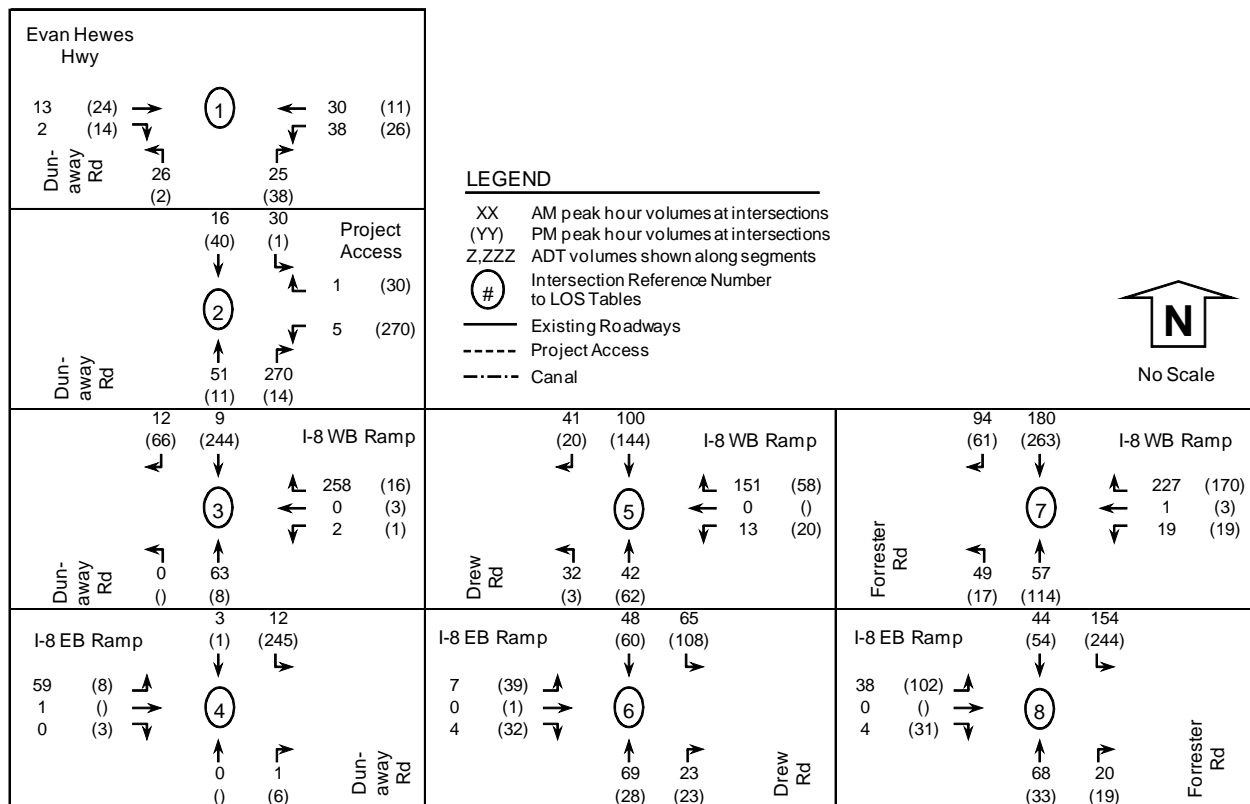
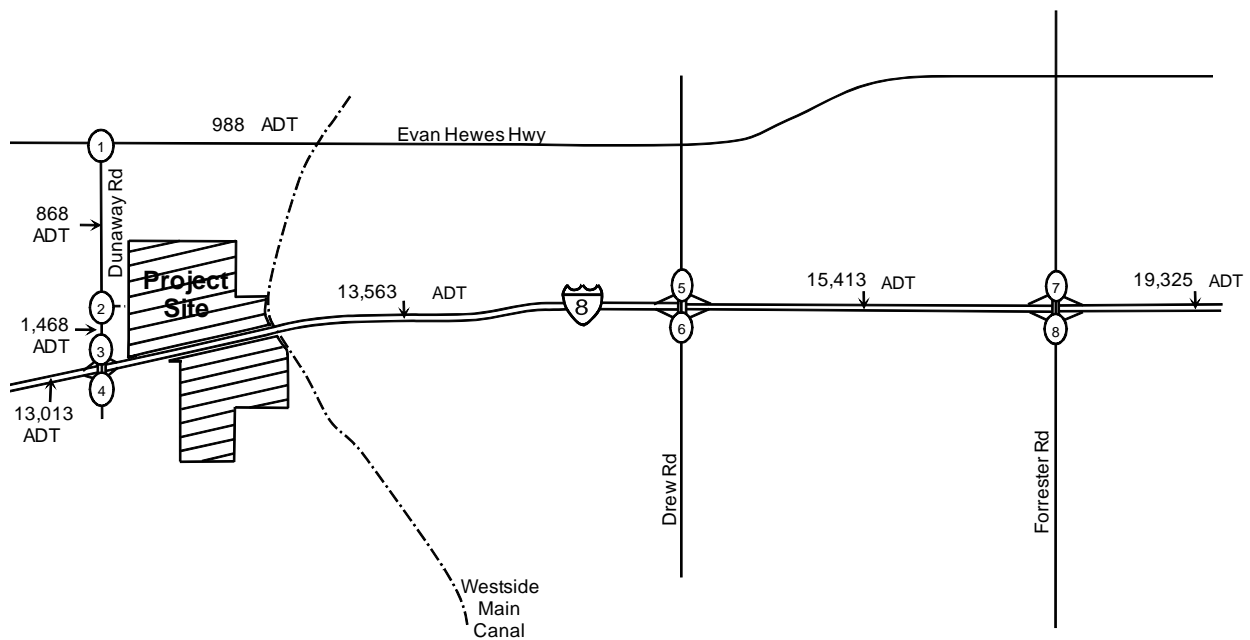
Notes: 1) Intersection Control - (S) Signalized, (U) Unsignalized. 2) Delay - HCM Average Control Delay in seconds. 3) LOS: Level of Service. 4) Delta is the increase in delay from project. 5) Direct Impact? (yes or no).

**TABLE 14: YEAR (2012) W/O & WITH PROJECT SEGMENT LOS (DREW INTERCHANGE OPEN)**

TABLE 14: YEAR 2012 V/C & WITH PROJECT SEGMENT LOS (DREW INTERCHANGE OPEN)													
Segment	Classification (as built)	Year 2012				Project		Year 2012 + Project				Impact?	
		Daily Volume	LOS C Capacity	V/C	LOS	Daily Volume	Daily Volume	LOS C Capacity	V/C	LOS	Change in V/C		
<b>Dunaway Road</b>													
I-8 to Project Access	Major Collector (2U)	793	7,100	0.11	A	675	1,468	7,100	0.21	A	0.10	No	
Project Access to Evan Hewes Hwy	Major Collector (2U)	793	7,100	0.11	A	75	868	7,100	0.12	A	0.01	No	
<b>Evan Hewes Hwy</b>													
Dunaway Road to Drew Rd	Prime Arterial (2U)	913	7,100	0.13	A	75	988	7,100	0.14	A	0.01	No	

Notes: Classification based on 1/29/08 Circulation and Scenic Highways Element. 2U = 2 lane undivided roadway. Daily volume is a 24 hour volume. LOS: Level of Service. LOS based on actual number of lanes currently constructed. V/C: Volume to Capacity ratio.

**Figure 12: Year (2012) + Project Volumes (Drew Interchange Open)**



**TABLE 15: YEAR (2012) W/O & WITH PROJECT FREEWAY LOS (DREW INTERCHANGE OPEN)**

Freeway Segment	I-8 Dunaway Rd to Drew Rd				I-8 Drew Rd to Forrester Rd				I-8 Forrester Rd to Imperial Ave			
Forecasted Year 2012	13,000				15,000				19,100			
ADT												
Peak Hour	A M		P M		A M		P M		A M		P M	
Direction	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB
Number of Lanes	2	2	2	2	2	2	2	2	2	2	2	2
Capacity (1)	4,700	4,700	4,700	4,700	4,700	4,700	4,700	4,700	4,700	4,700	4,700	4,700
K Factor (2)	0.1076	0.0963	0.0917	0.1517	0.1076	0.0963	0.0917	0.1517	0.1076	0.0963	0.0917	0.1517
D Factor (3)	0.2616	0.7384	0.4419	0.5581	0.2616	0.7384	0.4419	0.5581	0.2616	0.7384	0.4419	0.5581
Truck Factor (4)	0.8376	0.8376	0.8376	0.8376	0.8376	0.8376	0.8376	0.8376	0.8376	0.8376	0.8376	0.8376
Peak Hour Volume	437	1,104	629	1,314	504	1,273	726	1,516	642	1,621	924	1,931
Volume to Capacity	0.093	0.235	0.134	0.280	0.107	0.271	0.154	0.323	0.137	0.345	0.197	0.411
LOS	A	A	A	A	A	A	A	B	A	B	A	B
Project Pk Hr Vol	4	225	225	12	2	165	165	10	0	90	90	7
2012 + Project												
Peak Hour Volume	441	1,329	854	1,326	506	1,438	891	1,526	642	1,711	1,014	1,938
Volume to Capacity	0.094	0.283	0.182	0.282	0.108	0.306	0.190	0.325	0.137	0.364	0.216	0.412
LOS	A	A	A	A	A	B	A	B	A	B	A	B
Increase in V/C	0.001	0.048	0.048	0.003	0.000	0.035	0.035	0.002	0.000	0.019	0.019	0.001
Impact?	None	None	None	None	None	None	None	None	None	None	None	None

Notes: (1) Capacity of 2,350 pcphpl from CALTRANS' Guide for the Preparation of Traffic Impact Studies, December 2002. (2) Latest K factor from Caltrans (based on 2007 report), which is the percentage of AADT in both directions. (3) Latest D factor from Caltrans (based on 2007 report), which when multiplied by K and ADT will provide peak hour volume. (4) Latest truck factor from Caltrans (based on 2007 report). Impact? = Direct, Cumulative, or None.

Under peak year 2012 + project conditions with Drew interchange open, the study roadways were calculated to operate at LOS C or better. No direct project impacts were calculated.

## 6.2 Peak Year (2012) + Project with Drew Interchange Closed

This scenario documents the anticipated project traffic added onto the peak year 2012 conditions with Drew Road around I-8 closed for travel. Year 2012 plus project construction volumes are shown in **Figure 13**. Intersection, segment, and freeway LOS are shown in **Tables 16, 17 and 18**. Intersection LOS calculations are included in **Appendix M**.

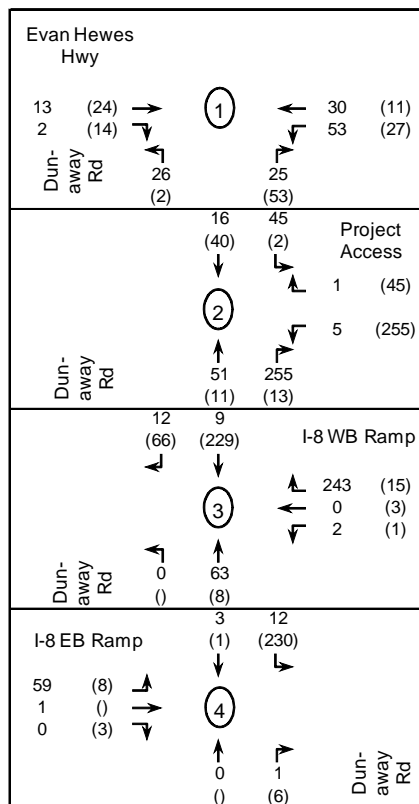
**TABLE 16: PEAK YEAR (2012) W/O & WITH PROJECT INTERSECTION LOS (DREW INTERCHANGE CLOSED)**

Intersection & (Control) <sup>1</sup>	Movement	Year (2012)		Year (2012) + Project			
		Delay <sup>2</sup>	LOS <sup>3</sup>	Delay <sup>2</sup>	LOS <sup>3</sup>	Delta <sup>4</sup>	Impact <sup>5</sup>
1) Dunaway Rd at Evan Hewes Hwy (U)	NB LR	8.8	A	9.2	A	0.4	No
	NB LR	8.6	A	8.7	A	0.1	No
2) Dunaway Rd at Project Access (U)	WB LR	Does not Exist	Does not Exist	10.3	B	NA	No
	WB LR			10.7	B	NA	No
3) Dunaway Rd at I-8 WB Ramp (U)	WB LR	8.5	A	9.9	A	1.4	No
	WB LR	8.8	A	8.9	A	0.1	No
4) Dunaway Rd at I-8 EB Ramp (U)	EB LR	8.9	A	9.0	A	0.1	No
	EB LR	8.7	A	12.3	B	3.6	No
5) Drew Rd at I-8 WB Ramp (U)	WB LR	Closed	Closed	Closed	Closed	NA	No
	WB LR	Closed	Closed	Closed	Closed	NA	No
6) Drew Rd at I-8 EB Ramp (U)	EB LR	Closed	Closed	Closed	Closed	NA	No
	EB LR	Closed	Closed	Closed	Closed	NA	No
7) Forrester Rd at I-8 WB Ramp (U)	WB LR	9.9	A	10.0	B	0.1	No
	WB LR	9.8	A	10.3	B	0.5	No
8) Forrester Rd at I-8 EB Ramp (U)	EB LR	12.7	B	13.5	B	0.8	No
	EB LR	17.8	C	18.1	C	0.3	No

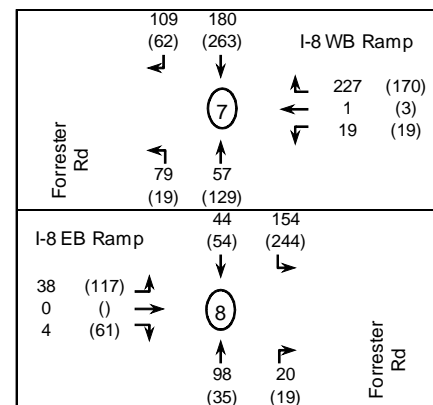
Notes: 1) Intersection Control - (S) Signalized, (U) Unsignalized. 2) Delay - HCM Average Control Delay in seconds. 3) LOS: Level of Service. 4) Delta is the increase in delay from project. 5) Direct Impact? (yes or no).

The map illustrates the project area, showing the intersection of Evan Hewes Hwy and Interstate 8. The project site is located on Dunaway Rd, which runs north-south. The map includes the following details:

- ADT Values:**
  - 1,025 ADT on Evan Hewes Hwy north of Dunaway Rd.
  - 905 ADT on Dunaway Rd north of the project site.
  - 1,431 ADT on Dunaway Rd south of the project site.
  - 13,013 ADT on the road south of Dunaway Rd.
  - 13,525 ADT on Interstate 8 west of Drew Rd.
  - 15,525 ADT on Interstate 8 east of Drew Rd.
  - 19,325 ADT on the road east of Forrester Rd.
- Roads:**
  - Evan Hewes Hwy (North-South)
  - Dunaway Rd (North-South)
  - Westside Main Canal (Dashed line)
  - Drew Rd (East-West)
  - Forrester Rd (East-West)
  - Interstate 8 (East-West)
- Project Site:** Indicated by a hatched area on Dunaway Rd.
- Intersections:**
  - Dunaway Rd and Evan Hewes Hwy (Circle 1)
  - Dunaway Rd and Interstate 8 (Circle 2)
  - Dunaway Rd and Westside Main Canal (Circle 3)
  - Dunaway Rd and Westside Main Canal (Circle 4)
  - Interstate 8 and Drew Rd (Circle 5)
  - Interstate 8 and Forrester Rd (Circle 6)
  - Forrester Rd and Interstate 8 (Circle 7)
  - Forrester Rd and Interstate 8 (Circle 8)



XX	AM peak hour volumes at intersections
(YY)	PM peak hour volumes at intersections
Z, ZZZ	ADT volumes shown along segments
(#)	Intersection Reference Number to LOS Tables
————	Existing Roadways
-----	Project Access
- - - - -	Canal



**TABLE 17: YEAR (2012) W/O & WITH PROJECT SEGMENT LOS (DREW INTERCHANGE CLOSED)**

Segment	Classification (as built)	Year 2012				Project Daily Volume	Year 2012 + Project					
		Daily Volume	LOS C Capacity	V/C	LOS		Daily Volume	LOS C Capacity	V/C	LOS	Change in V/C	Impact?
<b>Dunaway Road</b>												
I-8 to Project Access	Major Collector (2U)	793	7,100	0.11	A	638	1,431	7,100	0.20	A	0.09	No
Project Access to Evan Hewes Hwy	Major Collector (2U)	793	7,100	0.11	A	112	905	7,100	0.13	A	0.02	No
<b>Evan Hewes Hwy</b>												
Dunaway Road to Drew Rd	Prime Arterial (2U)	913	7,100	0.13	A	112	1,025	7,100	0.14	A	0.02	No

Notes: Classification based on 1/29/08 Circulation and Scenic Highways Element. 2U = 2 lane undivided roadway. Daily volume is a 24 hour volume. LOS: Level of Service. LOS based on actual number of lanes currently constructed. V/C: Volume to Capacity ratio.

**TABLE 18: YEAR (2012) W/O & WITH PROJECT FREEWAY LOS (DREW INTERCHANGE CLOSED)**

Freeway Segment	I-8 Dunaway Rd to Drew Rd				I-8 Drew Rd to Forrester Rd				I-8 Forrester Rd to Imperial Ave			
	Forecasted Year 2012				Forecasted Year 2012				Forecasted Year 2012			
ADT	13,000				15,000				19,100			
Peak Hour	A M				A M				A M			
Direction	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB
Number of Lanes	2	2	2	2	2	2	2	2	2	2	2	2
Capacity (1)	4,700	4,700	4,700	4,700	4,700	4,700	4,700	4,700	4,700	4,700	4,700	4,700
K Factor (2)	0.1076	0.0963	0.0917	0.1517	0.1076	0.0963	0.0917	0.1517	0.1076	0.0963	0.0917	0.1517
D Factor (3)	0.2616	0.7384	0.4419	0.5581	0.2616	0.7384	0.4419	0.5581	0.2616	0.7384	0.4419	0.5581
Truck Factor (4)	0.8376	0.8376	0.8376	0.8376	0.8376	0.8376	0.8376	0.8376	0.8376	0.8376	0.8376	0.8376
Peak Hour Volume	437	1,104	629	1,314	504	1,273	726	1,516	642	1,621	924	1,931
Volume to Capacity	0.093	0.235	0.134	0.280	0.107	0.271	0.154	0.323	0.137	0.345	0.197	0.411
LOS	A	A	A	A	A	A	A	B	A	B	A	B
Project Pk Hr Vol	4	210	210	11	4	210	210	11	2	90	90	5
<b>2012 + Project</b>												
Peak Hour Volume	441	1,314	839	1,325	508	1,483	936	1,527	644	1,711	1,014	1,936
Volume to Capacity	0.094	0.279	0.178	0.282	0.108	0.316	0.199	0.325	0.137	0.364	0.216	0.412
LOS	A	A	A	A	A	B	A	B	A	B	A	B
Increase in V/C	0.001	0.045	0.045	0.002	0.001	0.045	0.045	0.002	0.000	0.019	0.019	0.001
Impact?	None	None	None	None	None	None	None	None	None	None	None	None

Notes: (1) Capacity of 2,350 pcphpl from CALTRANS' Guide for the Preparation of Traffic Impact Studies, December 2002. (2) Latest K factor from Caltrans (based on 2007 report), which is the percentage of AADT in both directions. (3) Latest D factor from Caltrans (based on 2007 report), which when multiplied by K and ADT will provide peak hour volume. (4) Latest truck factor from Caltrans (based on 2007 report). Impact? = Direct, Cumulative, or None.

Under year 2012 + project conditions with Drew interchange closed, the study roadways were calculated to operate at LOS C or better. No direct project impacts were calculated.

## 7.0 Cumulative Projects (New Development)

Information on cumulative projects (new development) was obtained from planning staff at the County of Imperial Planning Department. A summary list titled *Project List – Feb. 2009* and a map titled *Proposed County Development Map* updated January 2009 were provided as the latest information. Additionally, County planning staff provided more recent information for cumulative projects in the Ocotillo area of Imperial Valley.

Upon review of the list and map, 19 cumulative projects were identified that would potentially add traffic to the study area roadways. A list of the cumulative projects (new development) is included below:

- 1) *Las Aldeas Specific Plan* – A mixed-use project of 2,156 single-family residential units, 84 multifamily residential units, 467 4-plex residential units, 27.95 acres of commercial zoning, 10.79 acres of light manufacturing zoning, 21.78 acres of parks, 48.18 acres of retention basin, and 23.09 acres for two school sites all generally located north of Adams Ave, east of Austin Road and west of La Brucheri Road. The total traffic generation for this cumulative project is calculated at 41,553 ADT with 2,860 AM and 4,227 PM peak hour trips.
- 2) *Linda Vista* – A mixed use project of 182 single family homes and a 6 acre commercial lot generally located on the west side of Clark Road between I-8 and McCabe Road. The traffic generation for this cumulative project is calculated at 7,175 ADT with 252 AM and 676 PM peak hour trips.
- 3) *Desert Village #6* – A project of 95 single-family homes, 260 apartments, and 7.3 acres of commercial generally located west of Clark Road between I-8 and Horne Road. The traffic generation for this cumulative project is calculated at 8,740 ADT with 331 AM and 818 PM peak hour trips.
- 4) *Commons* – A regional shopping center of 780,000 square feet generally located on the east side of Dogwood Avenue between I-8 and Danenberg Drive. The traffic generation for this cumulative project is calculated at 20,648 ADT with 430 AM and 1,943 PM peak hour trips.
- 5) *Imperial Valley Mall* – A regional shopping center of 1,460,000 square feet and 306 single family homes generally located on the southeast corner of Dogwood Avenue and Danenberg Road. The traffic generation for this cumulative project is calculated at 47,300 ADT with 1,095 AM and 4,440 PM peak hour trips.
- 6) *Miller Burson* – A project of 570 single-family homes south of Ross Road and east of Austin Road. The traffic generation for this cumulative project is calculated at 5,455 ADT with 427 AM and 576 PM peak hour trips.
- 7) *Courtyard Villas* – A project of 54 single family homes generally located northwest of I-8 and Austin Road. The traffic generation for this cumulative project is calculated at 517 ADT with 40 AM and 56 PM peak hour trips.

- 8) *Willow Bend (East) & West Willow Bend* – A combined project of 216 single family homes generally located on the northeast corner of Clark Road and McCabe Road. The traffic generation for this cumulative project is calculated at 2,067 ADT with 162 AM and 218 PM peak hour trips.
- 9) *Lotus Ranch* – A residential project of 616 single-family homes and a 600 student elementary school generally located on the southwest corner of I-8 and La Bruchaeri Road. The traffic generation for this cumulative project is calculated at 5,830 ADT with 529 AM and 605 PM peak hour trips.
- 10) *Mosaic* – A residential project of 1,156 single-family units and 2.7 acres of commercial generally located south of SR-86 and bisected by Dogwood Road. The project is calculated to generate 11,585 ADT with 845 AM peak hour trips and 1,157 PM peak hour trips.
- 11) *Hallwood/Calexico Place III & Casino* – Mixed use project of residential, commercial, and casino generally located on the southwest corner of SR-111 and Jasper Road. With application of internal and pass-by reductions, the project is calculated to add 59,285 ADT with 3,286 AM peak hour trips and 6,071 PM peak hour trips to the surrounding roadways.
- 12) *Calexico Mega Park* – Mixed use project of a commercial and regional shopping center on the southeast corner of SR-111 and Jasper Road. With application of internal and pass-by reductions, the project is calculated to add 51,338 ADT with 2,054 AM peak hour trips and 4,903 PM peak hour trips to the surrounding roadways.
- 13) *County Center II Expansion* – a mixed use project of a commercial center, expansion of the Imperial County Office of Education, a Joint-Use Teacher Training and Conference Center, Judicial Center, County Park, Jail expansion, County Administrative Complex, Public Works Administration, and a County Administrative Complex located on the southwest corner of McCabe Road and Clark Road. The total project is calculated to generate 24,069 ADT with 2,581 AM peak hour trips and 2,242 PM peak hour trips.
- 14) *Desert Springs Resort* – a member's only resort community is for motor sports, water sports, and recreational vehicle (RV) enthusiasts with a maximum occupancy of 210 days per year. The resort includes an estimated total of up to 411 water sports lots, 792 recreational vehicle lots, 32 estate lots, 150 vacation villas, and 100 garage villas for a project total of up to 1,475 units generally located northeast of Westmoreland Road and Boley Road.. The project weekday traffic generation is calculated to generate 7,275 ADT, with 383 AM peak hour trips and 714 PM peak hour trips.
- 15) *Mt Signal* – a proposed 49.4 megawatt solar hybrid power station on roughly 974 acres generally located west of Drew Road and south of Diehl Road (south of I-8). The construction phase is calculated to generate 632 daily trips with 310 AM peak hour trips and 301 PM peak hour trips.
- 16) *Coyote Wells (Wind Zero)* – a mixed-use, three-phase development on approximately 944 acres generally located in the Ocotillo/Nomirage Area. The land uses include recreation, education and training, tourism, residential, storage, and hotel/resort. Phase 1 of the project is calculated with a weekday traffic generation of 538 ADT, with 134 AM peak hour trips and 134 PM

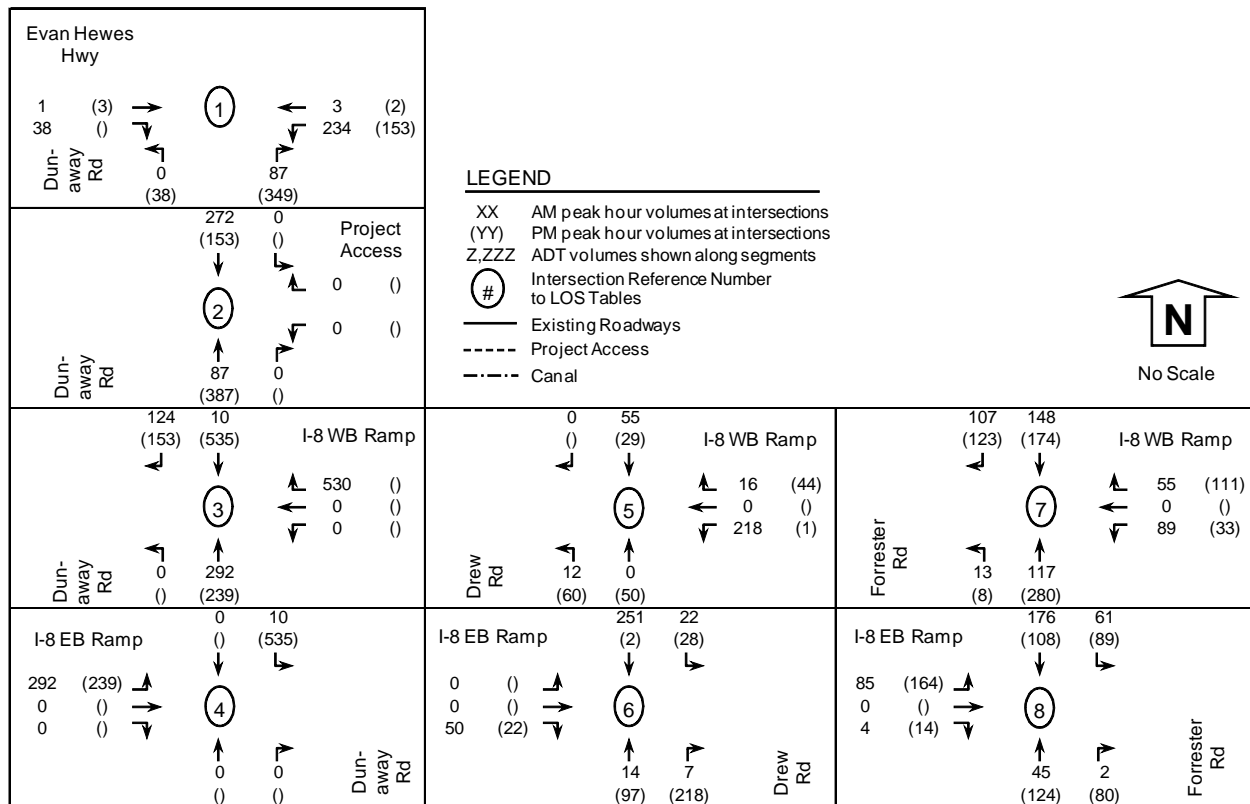
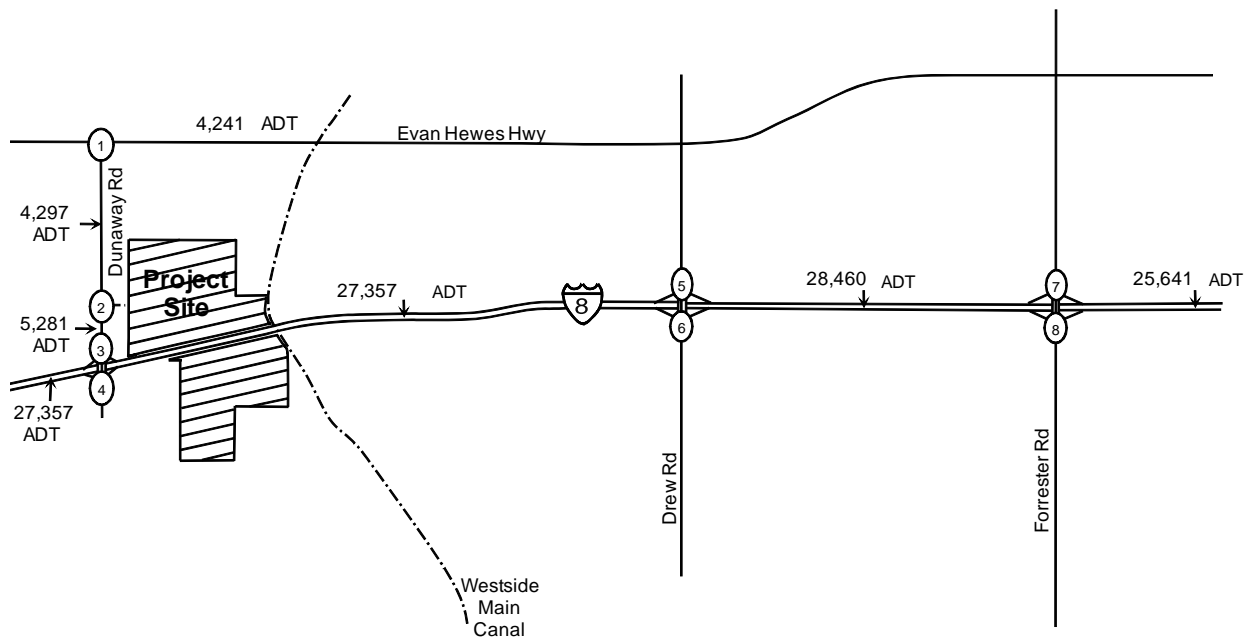
peak hour trips.

- 17) *Granite Carroll Sand and Gravel Mine* – a mining operation located approximately 4 miles northwest of Ocotillo. The project is estimated to generate 834 daily trips.
- 18) *Imperial Valley Solar Project (Formerly SES Solar Two)* – an electric generating facility capable of producing approximately 750 megawatts of electricity on approximately 6,500 acres generally located west of Dunaway Road and north of I-8. The construction phase of the project is calculated to generate 1,736 ADT with 772 AM peak hour trips and 772 PM peak hour trips.
- 19) *Imperial Solar Energy Center South* – a photovoltaic solar facility capable of producing approximately 200 megawatts of electricity on approximately 950 acres generally located south of SR-98 and east of Drew Road. The construction phase of the project is calculated to generate 680 ADT with 271 AM peak hour trips and 280 PM peak hour trips.

The cumulative project (new development) volumes are shown on **Figure 14**. Copies of the individual cumulative project descriptions, locations, traffic generation, and assignments are included in **Appendix N**.



**Figure 14: Cumulative Project (New Development) Volumes**



## 8.0 Year (2012) + Cumulative Conditions

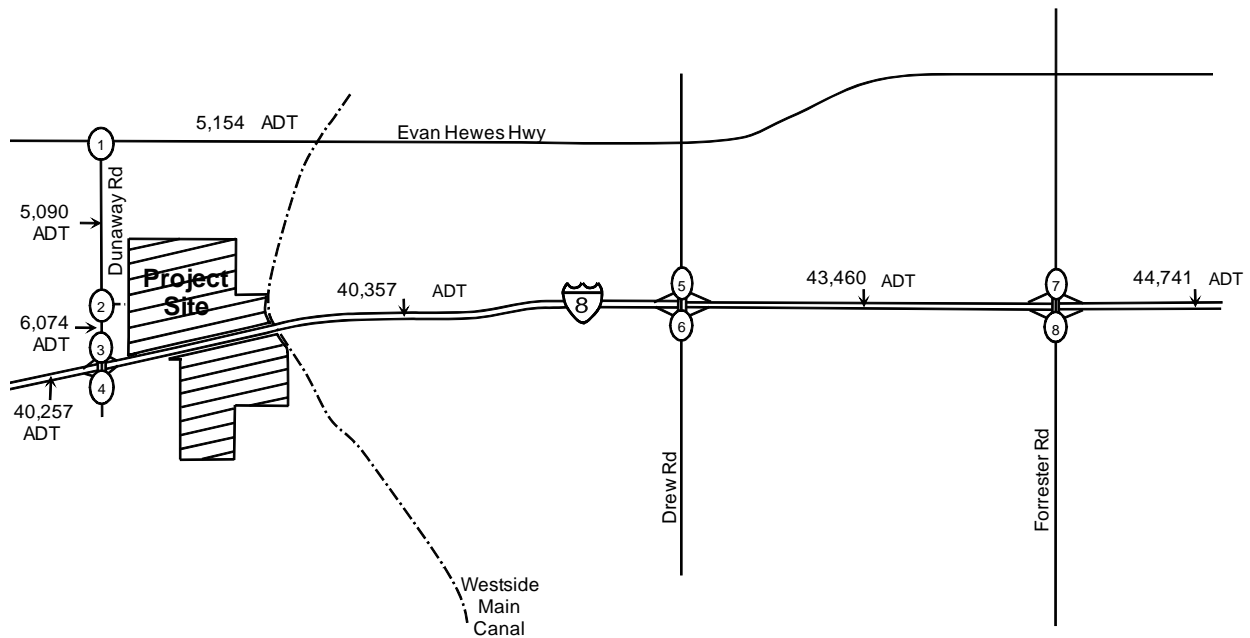
This scenario documents the anticipated cumulative traffic added onto year 2012 conditions with Drew Road around I-8 open for travel. Year 2012 plus cumulative volumes are shown in **Figure 15**. Intersection, segment, and freeway LOS are shown in **Tables 19, 20 and 21**. Intersection LOS calculations are included in **Appendix O**.

**TABLE 19: YEAR (2012) WITHOUT AND WITH CUMULATIVE INTERSECTION LOS**

Intersection & (Control) <sup>1</sup>	Movement	Peak Hour	Year (2012) + Cumulative	
			Delay <sup>2</sup>	LOS <sup>3</sup>
1) Dunaway Rd at Evan Hewes Hwy (U)	NB LR	AM	10.7	B
	NB LR	PM	12.1	B
2) Dunaway Rd at Project Access (U)	WB LR	AM	Does not Exist	Does not Exist
	WB LR	PM		
3) Dunaway Rd at I-8 WB Ramp (U)	WB LR	AM	33.9	D
	WB LR	PM	15.4	C
4) Dunaway Rd at I-8 EB Ramp (U)	EB LR	AM	10.8	B
	EB LR	PM	>500	F
5) Drew Rd at I-8 WB Ramp (U)	WB LR	AM	11.4	B
	WB LR	PM	9.7	A
6) Drew Rd at I-8 EB Ramp (U)	EB LR	AM	10.8	B
	EB LR	PM	10.7	B
7) Forrester Rd at I-8 WB Ramp (U)	WB LR	AM	14.1	B
	WB LR	PM	17.0	C
8) Forrester Rd at I-8 EB Ramp (U)	EB LR	AM	30.7	D
	EB LR	PM	392.7	F

Notes: 1) Intersection Control - (S) Signalized, (U) Unsignalized. 2) Delay - HCM Average Control Delay in seconds.

**Figure 15: Year (2012) + Cumulative Volumes**



<div>Evan Hewes Hwy</div> <div><div><div>14 40</div><div>(27) (14)</div><div>→</div></div><div><div>26 (40)</div><div>←</div></div><div><div>1</div><div>←</div></div><div><div>33 242</div><div>(13) (178)</div><div>←</div></div></div>		<div>LEGEND</div> <div>XX AM peak hour volumes at intersections</div> <div>(YY) PM peak hour volumes at intersections</div> <div>Z,ZZZ ADT volumes shown along segments</div> <div># Intersection Reference Number to LOS Tables</div> <div>Existing Roadways</div> <div>Project Access</div> <div>Canal</div>		<div><div>↑</div><div>N</div><div>↑</div></div> <div>No Scale</div>	
<div><div>Dun- away Rd</div><div><div>288 (193)</div><div>↓</div></div><div><div>2</div><div>↑</div></div><div><div>138 (398)</div><div>↑</div></div><div><div>0 ( )</div><div>←</div></div><div><div>0 ( )</div><div>←</div></div><div><div>0 ( )</div><div>←</div></div><div><div>0 ( )</div><div>←</div></div><div><div>0 ( )</div><div>←</div></div><div><div>0 ( )</div><div>←</div></div><div><div>0 ( )</div><div>←</div></div><div><div>0 ( )</div><div>←</div></div><div><div>0 ( )</div><div>←</div></div><div><div>0 ( )</div><div>←</div></div><div><div>0 ( )</div><div>←</div></div><div><div>0 ( )</div><div>←</div></div><div><div>0 ( )</div><div>←</div></div><div><div>0 ( )</div><div>←</div></div><div><div>0 ( )</div><div>←</div></div><div><div>0 ( )</div><div>←</div></div><div><div>0 ( )</div><div>←</div></div><div><div>0 ( )</div><div>←</div></div><div><div>0 ( )</div><div>←</div></div><div><div>0 ( )</div><div>←</div></div><div><div>0 ( )</div><div>←</div></div><div><div>0 ( 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**LEGEND**

- XX AM peak hour volumes at intersections
- (YY) PM peak hour volumes at intersections
- Z,ZZZ ADT volumes shown along segments
- # Intersection Reference Number to LOS Tables
- Existing Roadways
- Project Access
- Canal



**TABLE 20: YEAR (2012) WITH AND WITH CUMULATIVE SEGMENT LOS**

Segment	Classification (as built)	Year 2012				Cumulative Daily Volume	Year 2012 + Cumulative			
		Daily Volume	LOS C Capacity	V/C	LOS		Daily Volume	LOS C Capacity	V/C	LOS
<b>Dunaway Road</b>										
I-8 to Project Access	Major Collector (2U)	793	7,100	0.11	A	5,281	6,074	7,100	0.86	C
Project Access to Evan Hewes Hwy	Major Collector (2U)	793	7,100	0.11	A	4,297	5,090	7,100	0.72	C
<b>Evan Hewes Hwy</b>										
Dunaway Road to Drew Rd	Prime Arterial (2U)	913	7,100	0.13	A	4,241	5,154	7,100	0.73	C

Notes: Classification based on 1/29/08 Circulation and Scenic Highways Element. 2U = 2 lane undivided roadway. Daily volume is a 24 hour volume. LOS: Level of Service. LOS based on actual number of lanes currently constructed. V/C: Volume to Capacity ratio.

**TABLE 21: YEAR (2012) WITHOUT AND WITH CUMULATIVE FREEWAY LOS**

Freeway Segment	I-8 Dunaway Rd to Drew Rd				I-8 Drew Rd to Forrester Rd				I-8 Forrester Rd to Imperial Ave			
Forecasted Year 2012	13,000				15,000				19,100			
ADT	13,000				15,000				19,100			
Peak Hour	A M		P M		A M		P M		A M		P M	
Direction	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB
Number of Lanes	2	2	2	2	2	2	2	2	2	2	2	2
Capacity (1)	4,700	4,700	4,700	4,700	4,700	4,700	4,700	4,700	4,700	4,700	4,700	4,700
K Factor (2)	0.1076	0.0963	0.0917	0.1517	0.1076	0.0963	0.0917	0.1517	0.1076	0.0963	0.0917	0.1517
D Factor (3)	0.2616	0.7384	0.4419	0.5581	0.2616	0.7384	0.4419	0.5581	0.2616	0.7384	0.4419	0.5581
Truck Factor (4)	0.8376	0.8376	0.8376	0.8376	0.8376	0.8376	0.8376	0.8376	0.8376	0.8376	0.8376	0.8376
Peak Hour Volume	437	1,104	629	1,314	504	1,273	726	1,516	642	1,621	924	1,931
Volume to Capacity	0.093	0.2348	0.1338	0.2796	0.1073	0.2709	0.1544	0.3226	0.1366	0.345	0.1966	0.4108
LOS	A	A	A	A	A	A	A	B	A	B	A	B
Cumulative Pk Hr Vol	26	825	840	34	118	416	411	178	61	66	89	214
2012 + Cumulative												
Peak Hour Volume	463	1,929	1,469	1,348	622	1,689	1,137	1,694	703	1,687	1,013	2,145
Volume to Capacity	0.098	0.410	0.313	0.287	0.132	0.359	0.242	0.360	0.150	0.359	0.216	0.456
LOS	A	B	B	A	A	B	A	B	A	B	A	B

Notes: (1) Capacity of 2,350 pcphpl from CALTRANS' Guide for the Preparation of Traffic Impact Studies, December 2002. (2) Latest K factor from Caltrans (based on 2007 report), which is the percentage of AADT in both directions. (3) Latest D factor from Caltrans (based on 2007 report), which when multiplied by K and ADT will provide peak hour volume. (4) Latest truck factor from Caltrans (based on 2007 report).

Under year 2012 + cumulative conditions, the study intersections and roadways were calculated to operate at LOS C or better, except for:

- 1) Intersection of Dunaway Road at I-8 WB Ramp (LOS D AM),
- 2) Intersection of Dunaway Road at I-8 EB Ramp (LOS F AM),
- 3) Intersection of Forrester Road at I-8 EB Ramp (LOS D AM & LOS F PM).

## 9.0 Peak Year (2012) + Cumulative + Project Conditions

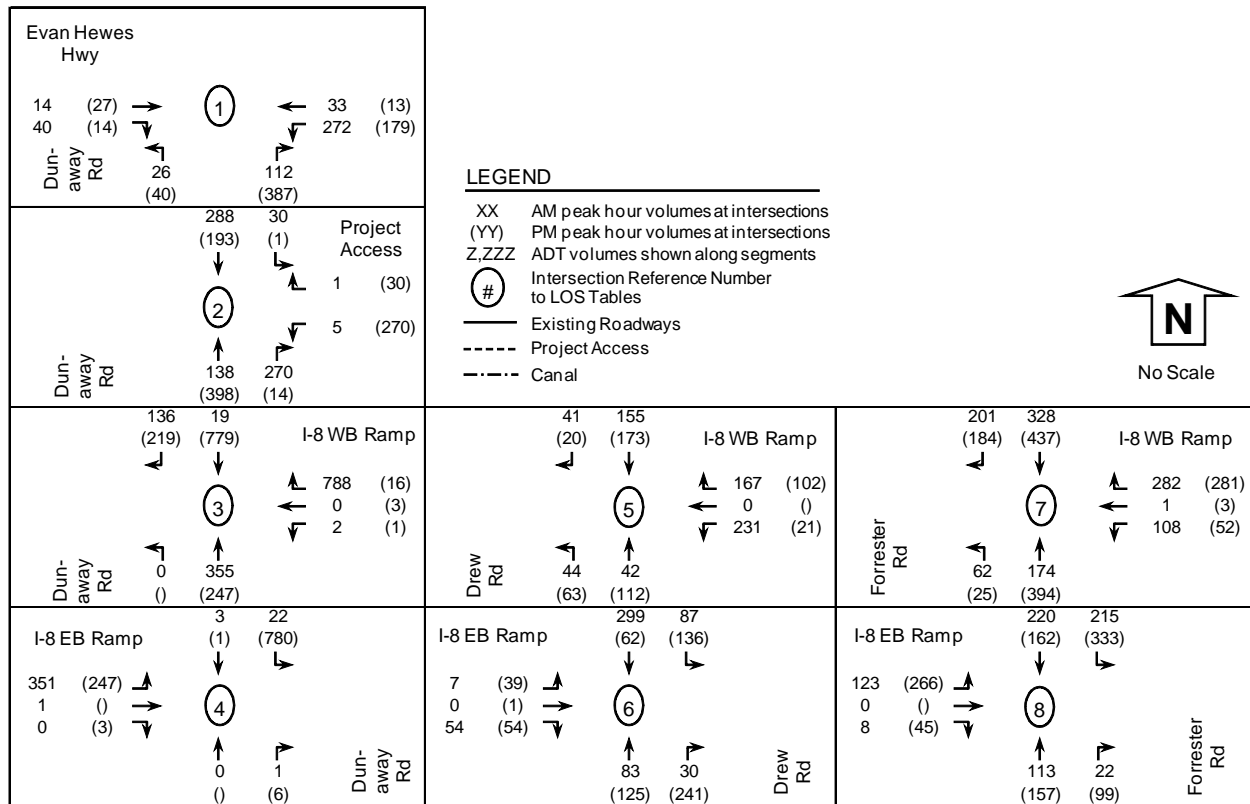
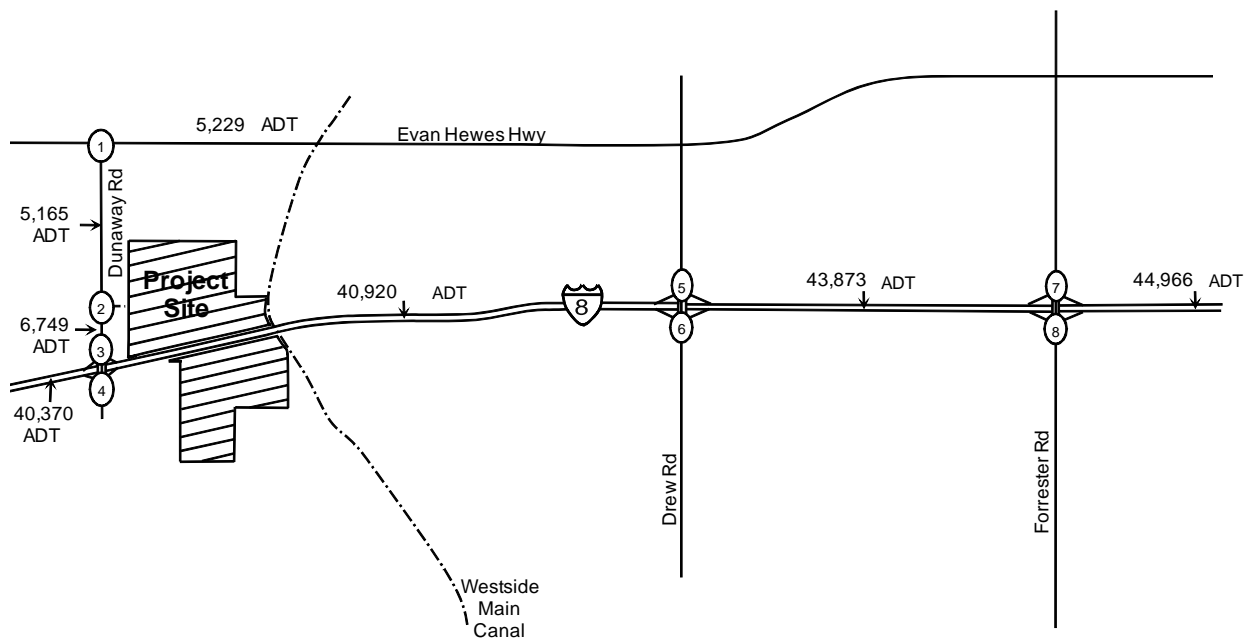
This scenario documents the anticipated project construction traffic added onto the year 2012 conditions with Drew Road around I-8 open for travel. Year 2012 plus project construction volumes are shown in **Figure 16**. Intersection, segment, and freeway LOS are shown in **Tables 22, 23 and 24**. Intersection LOS calculations are included in **Appendix P**.

**TABLE 22: YEAR (2012) + CUMULATIVE W/O & WITH PROJECT INT. LOS**

Intersection & (Control) <sup>1</sup>	Movement	Peak Hour	Year (2012)		Year (2012) + Cumulative + Project			
			Delay <sup>2</sup>	LOS <sup>3</sup>	Delay <sup>2</sup>	LOS <sup>3</sup>	Delta <sup>4</sup>	Impact <sup>5</sup>
1) Dunaway Rd at Evan Hewes Hwy (U)	NB LR	AM	10.7	B	11.0	B	0.3	None
	NB LR	PM	12.1	B	12.5	B	0.4	None
2) Dunaway Rd at Project Access (U)	WB LR	AM	Does not Exist	Does not Exist	13.3	B	NA	None
	WB LR	PM			32.2	D	NA	Cumulative
3) Dunaway Rd at I-8 WB Ramp (U)	WB LR	AM	33.9	D	163.0	F	129.1	Cumulative
	WB LR	PM	15.4	C	16.0	C	0.6	None
4) Dunaway Rd at I-8 EB Ramp (U)	EB LR	AM	10.8	B	11.5	B	0.7	None
	EB LR	PM	>500	F	>500	F	>10	Cumulative
5) Drew Rd at I-8 WB Ramp (U)	WB LR	AM	11.4	B	12.7	B	1.3	None
	WB LR	PM	9.7	A	10.0	B	0.3	None
6) Drew Rd at I-8 EB Ramp (U)	EB LR	AM	10.8	B	11.0	B	0.2	None
	EB LR	PM	10.7	B	12.1	B	1.4	None
7) Forrester Rd at I-8 WB Ramp (U)	WB LR	AM	14.1	B	15.5	C	1.4	None
	WB LR	PM	17.0	C	18.5	C	1.5	None
8) Forrester Rd at I-8 EB Ramp (U)	EB LR	AM	30.7	D	33.6	D	2.9	Cumulative
	EB LR	PM	392.7	F	>500	F	>10	Cumulative

Notes: 1) Intersection Control - (S) Signalized, (U) Unsignalized. 2) Delay - HCM Average Control Delay in seconds. 3) LOS: Level of Service. 4) Delta is the increase in delay from project. 5) Impact? (None, cumulative, or direct).

**Figure 16: Year (2012) + Cumulative + Project Volumes**



**TABLE 23: YEAR (2012) + CUMULATIVE W/O & WITH PROJECT SEGMENT LOS**

Segment	Classification (as built)	Year 2012 + Cumulative				Project Daily Volumes	Year 2012 + Cumulative + Project				
		Daily Volume	LOS C Capacity	V/C	LOS		Daily Volume	LOS C Capacity	V/C	LOS	Impact?
<b>Dunaway Road</b>											
I-8 to Project Access	Major Collector (2U)	6,074	7,100	0.86	C	675	6,749	7,100	0.95	C	None
Project Access to Evan Hewes Hwy	Major Collector (2U)	5,090	7,100	0.72	C	75	5,165	7,100	0.73	C	None
<b>Evan Hewes Hwy</b>											
Dunaway Road to Drew Rd	Prime Arterial (2U)	5,154	7,100	0.73	C	75	5,229	7,100	0.74	C	None

Notes: Classification based on 1/29/08 Circulation and Scenic Highways Element. 2U = 2 lane undivided roadway. Daily volume is a 24 hour volume. LOS: Level of Service. LOS based on actual number of lanes currently constructed. V/C: Volume to Capacity ratio. Impact = (None, Direct, Cumulative).

**TABLE 24: YEAR (2012) + CUMULATIVE W/O & WITH PROJECT FREEWAY LOS**

Freeway Segment	I-8				I-8				I-8			
	Dunaway Rd to Drew Rd				Drew Rd to Forrester Rd				Forrester Rd to Imperial Ave			
Forecasted Year 2012												
ADT	13,000				15,000				19,100			
Peak Hour	A M		P M		A M		P M		A M		P M	
Direction	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB
Number of Lanes	2	2	2	2	2	2	2	2	2	2	2	2
Capacity (1)	4700	4700	4700	4700	4700	4700	4700	4700	4700	4700	4700	4700
K Factor (2)	0.1076	0.0963	0.0917	0.1517	0.1076	0.0963	0.0917	0.1517	0.1076	0.0963	0.0917	0.1517
D Factor (3)	0.2616	0.7384	0.4419	0.5581	0.2616	0.7384	0.4419	0.5581	0.2616	0.7384	0.4419	0.5581
Truck Factor (4)	0.8376	0.8376	0.8376	0.8376	0.8376	0.8376	0.8376	0.8376	0.8376	0.8376	0.8376	0.8376
Peak Hour Volume	437	1104	629	1314	504	1273	726	1516	642	1621	924	1931
Volume to Capacity	0.093	0.2348	0.1338	0.2796	0.1073	0.2709	0.1544	0.3226	0.1366	0.345	0.1966	0.4108
LOS	A	A	A	A	A	A	A	B	A	B	A	B
Cumulative + Project	30	1050	1065	46	120	581	576	188	61	156	179	221
2012 + Cumulative + Project												
Peak Hour Volume	467	2154	1694	1360	624	1854	1302	1704	703	1777	1103	2152
Volume to Capacity	0.099	0.458	0.360	0.289	0.133	0.395	0.277	0.363	0.150	0.378	0.235	0.458
LOS	A	B	B	A	A	B	A	B	A	B	A	B
Increase in V/C	0.001	0.048	0.048	0.003	0.000	0.035	0.035	0.002	0.000	0.019	0.019	0.001
Impact?	None	None	None	None	None	None	None	None	None	None	None	None

Notes: (1) Capacity of 2,350 pcphpl from CALTRANS' Guide for the Preparation of Traffic Impact Studies, December 2002. (2)

Latest K factor from Caltrans (based on 2007 report), which is the percentage of AADT in both directions. (3) Latest D factor from Caltrans (based on 2007 report), which when multiplied by K and ADT will provide peak hour volume. (4) Latest truck factor from Caltrans (based on 2007 report). Impact? = Direct, Cumulative, or None.

Under year 2012 + cumulative + project conditions, the study roadways were calculated to operate at LOS C or better, except for:

- 1) Intersection of Dunaway Road at Project Access (LOS D PM),
- 2) Intersection of Dunaway Road at I-8 WB Ramp (LOS F AM),
- 3) Intersection of Dunaway Road at I-8 EB Ramp (LOS F AM), and
- 4) Intersection of Forrester Road at I-8 EB Ramp (LOS D AM & LOS F PM).

The project is calculated to have cumulative impacts too the above noted intersections.

## 10.0 Horizon Year (2030) + Project Conditions

Three sources were reviewed for horizon year 2030 volumes and the highest of the three was used to calculate segment operations under 2030 conditions. The three sources included:

- 1) Existing + cumulative + project as previously calculated.
- 2) Existing forecasted to year 2030 by applying a growth factor of 73.7 percent. This growth factor was calculated by compounding the previously defined annual growth rate of 2.8 percent for 20 years (from year 2010 to year 2030). The project traffic was added on top of this forecast.
- 3) The *Imperial County Circulation Element Update* volumes to which the horizon year 2030 volumes were interpolated from the listed 2025 and 2050 volumes. The *Imperial County Circulation Element Update* listed volumes, and LOS lookup tables are included in **Appendix Q**.

The horizon year 2030 + project segment operations are shown in **Table 25**.

**TABLE 25: HORIZON YEAR (2030) SEGMENT OPERATIONS**

Segment	Circulation and Scenic Highways Element Classification	Source 1: Existing + Cumulative + Project	Source 2: Year 2010 at 2.8%/yr to Year 2030	Source 3: Year 2030 Daily Volume Interpolated	Year 2030 highest of the 3 noted to the left	LOS C Capacity at Year 2030 Classification	V/C	LOS
<b>Dunaway Road</b>								
I-8 to Project Access	Major Collector	6,749	1,304	3,100	6,749	27,400	0.25	A
Project Access to Evan Hewes Hwy	Major Collector	5,165	1,304	3,100	5,165	27,400	0.19	A
<b>Evan Hewes Hwy</b>								
Dunaway Road to Drew Rd	Prime Arterial	5,229	1,503	Vol. Not Listed	5,229	44,600	0.12	A

Notes: Classification based on Table 3 of Circulation and Scenic Highways Element. 4U = 4 lane undivided roadway. Daily volume is a 24 hour volume. LOS: Level of Service. V/C: Volume to Capacity ratio. Vol. = Volume.

Under horizon year 2030 + project conditions, the study segments were calculated to operate at LOS C or better based on the study segments being built to year 2030 roadway classifications.

## 11.0 Significant Impacts and Recommended Mitigation Measures

The project is calculated to have cumulative impacts at the:

- 1) Intersection of Dunaway Road at Project Access (LOS D PM),
- 2) Intersection of Dunaway Road at I-8 WB Ramp (LOS F AM),
- 3) Intersection of Dunaway Road at I-8 EB Ramp (LOS F AM), and
- 4) Intersection of Forrester Road at I-8 EB Ramp (LOS D AM & LOS F PM).

The cumulative impacts noted above are due to background traffic growth from surrounding new development. If a majority of the proposed new development does not materialize, then the cumulatively impacted intersections may continue to operate at acceptable levels of service and would not require mitigation. Therefore, it is recommended that a mitigation monitoring and reporting program be established to determine if the aforementioned intersections would operate at un-acceptable LOS starting in year 2012 and beyond annually until the project construction is completed. If un-acceptable LOS is documented in year 2012, then fair share is recommended as the mitigation measure.

It should also be noted that the fair share participation is based on the project's construction traffic that is significantly higher than the project's traffic after completion of construction (i.e. 285 temporary construction employees vs. 4 permanent operation employees).

If un-acceptable LOS is not documented at the cumulatively impacted intersections based on the mitigation monitoring and reporting program, then the applicant's fair share contribution (based on construction traffic) should be refunded. If the County desires some form of mitigation, then it is recommended that the fair share contribution (based on permanent operation employees) be conditioned.

The cumulatively impacted intersections with operations before and after proposed mitigation with fair share percentages are summarized below in **Table 26** with LOS and fair share calculations included in **Appendix R**.

**TABLE 26: IMPACT SUMMARY**

Cumulative Impact Location	Peak Hour	Without Mitigation			Recommended Mitigation	WITH Mitigation			Fair Share % Construction Traffic	Fair Share % Operations Traffic
		2012 + C + P				2012 + C + P				
		Delay <sup>1</sup>	LOS <sup>2</sup>	Impact <sup>3</sup>		Delay <sup>1</sup>	LOS <sup>2</sup>	Impact <sup>3</sup>		
2) Dunaway Rd at Project Access (U)	AM	13.3	B	None	Install All Way	10.5	B	None	41.4%	0.9%
	PM	32.2	D	Cumulative	Stop Control	15.6	C	None		
3) Dunaway Rd at I-8 WB Ramp (U)	AM	163.0	F	Cumulative	Install	24.3	C	None	22.9%	0.4%
	PM	16.0	C	None	Traffic Signal	28.5	C	None		
4) Dunaway Rd at I-8 EB Ramp (U)	AM	11.5	B	None	Install	11.2	B	None	18.3%	0.9%
	PM	>500	F	Cumulative	Traffic Signal	24.7	C	None		
8) Forrester Rd at I-8 EB Ramp (U)	AM	33.6	D	Cumulative	Install	15.6	B	None	9.8%	0.2%
	PM	>500	F	Cumulative	Traffic Signal	26.8	C	None		

Notes: 1) Delay - HCM Average Control Delay in seconds. 2) LOS: Level of Service. 3) Impact type (None, cumulative, or direct).

## 12.0 Conclusions and Recommendations

The project is a photovoltaic solar facility capable of producing approximately 250 megawatts of electricity on approximately 1,130 acres of previously disturbed agricultural land. The project is generally located east of Dunaway Road and bisected by I-8.

The project trip generation consists of a construction phase and operations phase. The construction activities are expected to require approximately 17 months. According to the applicant, the construction workforce is expected to reach a peak of approximately 285 workers with hours generally between 7am and 3pm Monday through Friday. Additionally, equipment deliveries and construction trucks will serve the project site. The highest construction phase of the project is calculated to generate 750 ADT with 306 AM peak hour trips and 315 PM peak hour trips. According to the applicant, the operations phase will require approximately 4 fulltime personnel for operations and maintenance. The project site will be staffed with a security guard 24 hours per day, seven days per week. Based on this information, the operations and maintenance trip generation is estimated at 10 to 15 ADT with 4 AM and 4 PM peak hour trips. Therefore, the higher and more conservative construction trip generation is used to determine potential project impacts.

Information on cumulative projects (new development) was obtained from planning staff at the County of Imperial Planning Department. A summary list titled *Project List – Feb. 2009* and a map titled *Proposed County Development Map* updated January 2009 were provided as the latest information. Upon review of the list and map, 19 cumulative projects were identified that would potentially add traffic to the study area roadways.

Seven scenarios were analyzed, that accounted for existing, project phasing, cumulative projects, and horizon year conditions. To account for the temporary closure of portions of Drew Road around the Interstate 8 interchange due to recent seismic activity in and around Imperial Valley, two alternatives are analyzed for year 2012 plus project scenario: 1) the interchange at I-8 and Drew Road open, and 2) the interchange at I-8 and Drew Road closed. Operational findings by scenario are summarized below:

- 1) Under existing year 2010 conditions, the study intersections and roadways were calculated to operate at LOS C or better.
- 2) Under year 2012 conditions, the study intersections and roadways were calculated to operate at LOS C or better.
- 3) Under year 2012 + project conditions with Drew interchange open, the study intersections and roadways were calculated to operate at LOS C or better. No direct project impacts were calculated.
- 4) Under year 2012 + project conditions with Drew interchange closed, the study roadways were calculated to operate at LOS C or better. No direct project impacts were calculated.

- 5) Under year 2012 + cumulative conditions, the study intersections and roadways were calculated to operate at LOS C or better, except for:
  - a. Intersection of Dunaway Road at I-8 WB Ramp (LOS D AM),
  - b. Intersection of Dunaway Road at I-8 EB Ramp (LOS F AM), and
  - c. Intersection of Forrester Road at I-8 EB Ramp (LOS D AM & LOS F PM).
- 6) Under year 2012 + cumulative + project conditions, the study roadways were calculated to operate at LOS C or better, except for:
  - a. Intersection of Dunaway Road at Project Access (LOS D PM),
  - b. Intersection of Dunaway Road at I-8 WB Ramp (LOS F AM),
  - c. Intersection of Dunaway Road at I-8 EB Ramp (LOS F AM), and
  - d. Intersection of Forrester Road at I-8 EB Ramp (LOS D AM & LOS F PM).The project is calculated to have cumulative impacts to both intersections noted above.
- 7) Under horizon year 2030 + project conditions, the study segments were calculated to operate at LOS C or better based on the study segments being built to year 2030 roadway classifications.

The project is calculated to have cumulative impacts at the:

- 1) Intersection of Dunaway Road at Project Access (LOS D PM),
- 2) Intersection of Dunaway Road at I-8 WB Ramp (LOS F AM),
- 3) Intersection of Dunaway Road at I-8 EB Ramp (LOS F AM), and
- 4) Intersection of Forrester Road at I-8 EB Ramp (LOS D AM & LOS F PM).

The cumulative impacts noted above are due to background traffic growth from surrounding new development and other solar project with temporary construction traffic. If a majority of the proposed new development does not materialize, then the cumulatively impacted intersections may continue to operate at acceptable levels of service and would not require mitigation. Therefore, it is recommended that a mitigation monitoring and reporting program be established to determine if the aforementioned intersections would operate at un-acceptable LOS starting in year 2012 and beyond annually until the project construction is completed. If un-acceptable LOS is documented in year 2012, then fair share is recommended as the mitigation measure.

It should also be noted that the fair share participation is based on the project's construction traffic that is significantly higher than the project's traffic after completion of construction (i.e. 285 temporary construction employees vs. 4 permanent operation employees) as follows:

- 1) Dunaway Road at Project Access (Construction = 41.4%, Permanent Emp. = 0.9%),
- 2) Dunaway Road at I-8 WB Ramp (Construction = 22.9%, Permanent Emp. = 0.4%),
- 3) Dunaway Road at I-8 EB Ramp (Construction = 18.3%, Permanent Emp. = 0.9%), and
- 4) Forrester Road at I-8 EB Ramp (Construction = 9.8%, Permanent Emp. = 0.2%).

If un-acceptable LOS is not documented at the cumulatively impacted intersections based on the mitigation monitoring and reporting program, then the applicant's fair share contribution (based on construction traffic) should be refunded. If the County desires some form of mitigation, then it is recommended that the fair share contribution (based on permanent operation employees) be conditioned.



## 13.0 References

Caltrans. December 2002. *Guide for the Preparation of Traffic Impact Studies*.

County of Imperial Department of Public Works. Dated March 12, 2007, revised June 29, 2007 and approved by the Board of Supervisors of the County of Imperial on August 7, 2007. *Traffic Study and Report Policy*.

Institute of Transportation Engineers, 1999. *Traffic Engineering Handbook, Fifth Edition*.

Imperial County Planning & Development Services Department. October 1, 2006. *Imperial County Circulation Element*.

Imperial County Planning & Development Services Department. January 29, 2008. *Circulation and Scenic Highways Element*.

Trafficware Ltd., 2003-2007. Synchro 7.0 computer software (build 773).

Transportation Research Board National Research Council Washington, D.C. 2000. *Highway Capacity Manual 2000*. CD ROM.



## **Appendix A**

### **Excerpts from Imperial County's Traffic Study and Report Policy**

COUNTY OF IMPERIAL

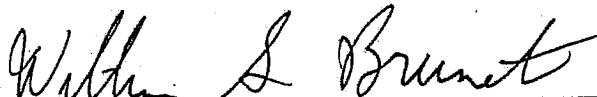
DEPARTMENT OF PUBLIC WORKS

TRAFFIC STUDY AND REPORT POLICY

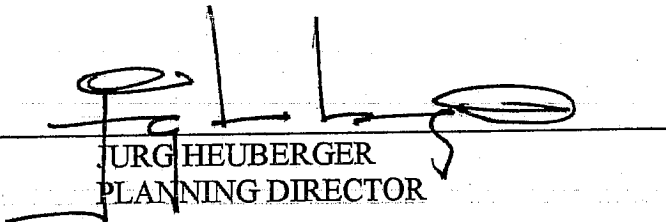
Date: March, 12, 2007

Revised June 29, 2007

**APPROVALS:**



WILLIAM S. BRUNET, P. E.  
DIRECTOR OF PUBLIC WORKS  
ROAD COMMISSIONER



JURG HEUBERGER  
PLANNING DIRECTOR

necessary to develop a traffic report that determines whether the traffic study general criteria have been met.

In the case of significant development, it may be necessary to hold one or more scope of work meetings which would be attended by a ICPDS staff, the County Traffic Engineer or other County Advisory Staff, the individual who will be responsible for preparing the traffic study report and the Traffic and/or Civil Engineer responsible for the report and its recommendations. The individual preparing the traffic study should be familiar with the project site and the local conditions which may affect any final conclusions and recommendations.

Listed below are the basic criteria that will be used to make the determination for providing a complete traffic study as a part of the project review process. The criteria are not a complete or exhaustive list, but they are intended to define when such a report is to be prepared and to indicate the necessary components of the study report to be submitted.

**1. General Criteria**

- a. Any project that adds more than 8% of the total existing vehicle trips on the adjacent road system at full build-out of the project.
- b. Any project that generates more than 400 daily residential trip ends, 800 commercial or industrial trip ends or 200 peak hour trip ends, as determined by the average trip rates contained in the ITE Trip Generation Informational Report or the **Imperial County local exceptions in Section 2.**
- c. Any project that has the potential to degrade an existing road section, an existing signalized intersection, or an existing unsignalized intersection to below the existing level of service or to cause it to be lower than a level of service (LOS)

*unit, unless it is for urban infill development, within one half mile of major retail and commercial developmentt.*

- b. Existing traffic on the adjacent road system and projected traffic on the adjacent road system, projected for a minimum of five (5) years, to project build-out, or both, depending on the project and the area; larger projects or high traffic generation may require future year build-out, currently Year 2030. Future CMP TIA reports would require additional traffic projection information.
- c. Traffic projections on the adjacent road system for both the project and "normal background growth" (demonstrated growth, as detailed in the general plan, or as agreed upon with County staff). Normally, traffic will be projected to Year 2030 or later for an updated future year condition.
- d. Traffic projections shall include the additional impact of undeveloped land or new development within an area surrounding the proposed development site (project) as agreed to by the County Director of Public Works, the County Planning Director and advisory staff.
- e. Projected impacts on intersections adjacent to or within the defined impact area of the project, using intersection capacity analysis - Highway Capacity Manual Operations Delay Method. Right turn-on-red volumes and changes in signal timing can be incorporated in a signalized intersection analysis, but any signal timing changes must be specifically identified in the study recommendations with additional cautions or impact conclusions identified if the timing changes are not

- m. Traffic counts, calculations, other basic information, and supporting data shall be included in an Appendix to the report or provided as a separate Technical Appendix. All actual traffic count data will be provided to the County in a useful summary form, digital and paper format, as specified by the County.

### 3. Analysis Methodology

The build-up method of traffic analysis will be followed, showing:

- a. Existing traffic;
- b. Existing traffic and normal background growth (rate and time to be agreed to by County staff);
- c. Existing traffic and normal background growth (see C. 3. b. above) and project build-out traffic;
- d. Existing traffic and normal background growth (see C. 3. b. above) and new development traffic (see C. 3. b. above);
- e. Existing traffic and 5 year normal background growth (see b. above) and new development (see b. above) and project build out, if longer than 5 years to build out of project.

If the study period to build-out is longer than 5 years, the future projection time period appropriate for a new development will be determined by the County staff. Significant projects may require a future projection time period of 20 years or General Plan build out. The future year is currently year 2030 as of the date of adopting this Policy. State Highway traffic projections will usually be carried to the year 2030 or to Caltrans current policy and procedures.

## **Appendix B**

### **Excerpts from Caltrans' Guide for the Preparation of Traffic Impact Studies**



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**GUIDE FOR THE PREPARATION  
OF  
TRAFFIC IMPACT STUDIES**

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**STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION**

**December 2002**

#### **D. Travel Forecasting (Transportation Modeling)**

The local or regional traffic model should reflect the most current land use and planned improvements (i.e., where programming or funding is secured). When a general plan build-out model is not available, the closest forecast model year to build-out should be used. If a traffic model is not available, historical growth rates and current trends can be used to project future traffic volumes. The TIS should clearly describe any changes made in the model to accommodate the analysis of a proposed project.

#### **V. TRAFFIC IMPACT ANALYSIS METHODOLOGIES**

Typically, the traffic analysis methodologies for the facility types indicated below are used by Caltrans and will be accepted without prior consultation. When a State highway has saturated flows, the use of a micro-simulation model is encouraged for the analysis (please note however, the micro-simulation model must be calibrated and validated for reliable results). Other analysis methods may be accepted, however, consultation between the lead agency, Caltrans and those preparing the TIS is recommended to agree on the data necessary for the analysis.

- A. Freeway Segments – Highway Capacity Manual (HCM)\*, operational analysis
- B. Weaving Areas – Caltrans Highway Design Manual (HDM)
- C. Ramps and Ramp Junctions – HCM\*, operational analysis or Caltrans HDM, Caltrans Ramp Metering Guidelines (most recent edition)
- D. Multi-Lane Highways – HCM\*, operational analysis
- E. Two-lane Highways – HCM\*, operational analysis
- F. Signalized Intersections<sup>8</sup> – HCM\*, Highway Capacity Software\*\*, operational analysis, TRAFFIX<sup>TM</sup>\*\*, Synchro\*\*, see footnote 8
- G. Unsignalized Intersections – HCM\*, operational analysis, Caltrans Traffic Manual for signal warrants if a signal is being considered
- H. Transit – HCM\*, operational analysis
- I. Pedestrians – HCM\*
- J. Bicycles – HCM\*
- K. Caltrans Criteria/Warrants – Caltrans Traffic Manual (stop signs, traffic signals, freeway lighting, conventional highway lighting, school crossings)
- L. Channelization – Caltrans guidelines for Reconstruction of Intersections, August 1985, Ichiro Fukutome

\*The most current edition of the Highway Capacity Manual, Transportation Research Board, National Research Council, should be used.

\*\***NOTE:** Caltrans does not officially advocate the use of any special software. However, consistency with the HCM is advocated in most but not all cases. The Caltrans local development review units utilize the software mentioned above. If different software or analytical techniques are used for the TIS then consultation between the lead agency, Caltrans and those preparing the TIS is recommended. Results that are significantly different than those produced with the analytical techniques above should be challenged.

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<sup>8</sup> The procedures in the Highway Capacity Manual "do not explicitly address operations of closely spaced signalized intersections. Under such conditions, several unique characteristics must be considered, including spill-back potential from the downstream intersection to the upstream intersection, effects of downstream queues on upstream saturation flow rate, and unusual platoon dispersion or compression between intersections. An example of such closely spaced operations is signalized ramp terminals at urban interchanges. Queue interactions between closely spaced intersections may seriously distort the procedures in" the HCM.

## **Appendix C**

### **Excerpts from Imperial County's Circulation and Scenic Highways Element**

## **CIRCULATION AND SCENIC HIGHWAYS ELEMENT**

**Prepared by:  
Imperial County Planning & Development Services Department  
801 Main Street  
El Centro, CA 92243**

**in collaboration with the**

**Imperial County Public Works Department  
155 South 11<sup>th</sup> Street  
El Centro, CA 92243**

**WILLIAM S. BRUNET, P.E.  
Director of Public Works**

**JURG HEUBERGER, AICP  
Planning & Development Services Director**

**Approved by:  
Planning Commission  
September 27, 2006**

**Approved by:  
Board of Supervisors  
October 17, 2006**

<b>TABLE 5</b> <b>IMPERIAL COUNTY STANDARD STREET CLASSIFICATION</b> <b>AVERAGE DAILY VEHICLE TRIPS</b>						
<b>Road</b>		<b>Level of Service (LOS)</b>				
<b>Class</b>	<b>X-Section</b>	<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	<b>E</b>
Expressway	154/210	30,000	42,000	60,000	70,000	80,000
Prime Arterial	106/136	22,200	37,000	44,600	50,000	57,000
Minor Arterial	82/102	14,800	24,700	29,600	33,400	37,000
Collector	64/84	13,700	22,800	27,400	30,800	34,200
Local Collector	40/70	1,900	4,100	7,100	10,900	16,200
Residential Street	40/60	*	*	<1,500	*	*
Residential Cul-de-Sac or Loop Street	40/60	*	*	<200	*	*
Industrial Collector	76/96	5,000	10,000	14,000	17,000	20,000
Industrial Local Street	44/64	2,500	5,000	7,000	8,500	10,000
* Levels of service are not applied to residential streets since their primary purpose is to serve abutting lots, not carry through traffic. Levels of service normally apply to roads carrying through traffic between major trip generators and attractors.						

Table 5 was originally developed for the County of San Diego by the San Diego County Department of Public Works in 1985 and compares ADT to levels of service (LOS) for various roadway classifications. Proposed functional classifications were then inserted into this table and right-of-way widths adjusted to match County of Imperial standards.

### Transition Areas

The Circulation and Scenic Highways Element is the graphical reference guide which shows the present and planned street system, along with the classification of those streets. It is important to note that where there is a change from one classification to another along a certain street, the transition will occur in mid-block areas to preclude non-continuing lanes and intersections. The design criteria (design, speed, curve radii, etc.) for the higher classification shall generally take precedence through the transition area. The County Director of Public Works shall review these transition areas and provide guidance in achieving this policy.

## **Appendix D**

### **Excerpts from Caltrans' Guide for the Preparation of Traffic Impact Studies**



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**GUIDE FOR THE PREPARATION  
OF  
TRAFFIC IMPACT STUDIES**

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**STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION**

**December 2002**

## Transition between LOS "C" and LOS "D" Criteria (Reference Highway Capacity Manual)

### BASIC FREEWAY SEGMENTS @ 65 mi/hr

LOS	Maximum Density (pc/mi/ln)	Minimum Speed (mph)	Maximum v/c	Maximum Service Flow Rate (pc/hr/ln)
A	11	65.0	0.30	710
B	18	65.0	0.50	1170
C	26	64.6	0.71	1680
D	35	59.7	0.89	2090
E	45	52.2	1.00	2350

### SIGNALIZED INTERSECTIONS and RAMP TERMINALS

LOS	Control Delay per Vehicle (sec/veh)
A	≤ 10
B	> 10 - 20
C	> 20 - 35
D	> 35 - 55
E	> 55 - 80
F	> 80

### MULTI-LANE HIGHWAYS @ 55 mi/hr

LOS	Maximum Density (pc/mi/ln)	Minimum Speed (mph)	Maximum v/c	Maximum Service Flow Rate (pc/hr/ln)
A	11	55.0	0.29	600
B	18	55.0	0.47	990
C	26	54.9	0.68	1430
D	35	52.9	0.88	1850
E	41	51.2	1.00	2100

\*\*\*\*\* Dotted line represents the transition between LOS "C" and LOS "D"

## **Appendix E**

### **Excerpts from Imperial County's Circulation and Scenic Highways Element**

## **CIRCULATION AND SCENIC HIGHWAYS ELEMENT**

**Prepared by:  
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**JURG HEUBERGER, AICP  
Planning & Development Services Director**

**Approved by:  
Planning Commission  
September 27, 2006**

**Approved by:  
Board of Supervisors  
October 17, 2006**

**c. New or enlarged Roads:**

**Local Roads**

The County shall require all new developments to provide for local roads to serve the direct access needs of abutting property. These streets should be designed with a discontinuous pattern to discourage through traffic. They generally should not intersect with arterial street classifications. Typical design features include two travel lanes with parking on both sides of the street. Local roads include loop streets and cul-de-sacs.

**Regional Roads (Roads beyond the actual development project)**

The County shall require that all new developments participate in the improvement of regional roads that may be impacted by the proposed development. The extent to which a project impacts regional roads is generally determined by a traffic study. In some cases however the County may have predetermined improvement requirements for certain road segments or road intersections. The new developments will be required to either make certain regional improvements or in the alternative contribute a “fair share” towards the cost of such improvements.

**d. Level of Service Standards**

As the County continues to grow, transportation demand management and systems management will be necessary to preserve and increase available roadway “capacity”. Level of Service (LOS) standards are used to assess the performance of a street or highway system and the capacity of a roadway.

An important goal when planning the transportation system is to maintain acceptable levels of service along the federal and state highways and the local roadway network. To accomplish this, the California Department of Transportation (Caltrans), Imperial County and local agencies adopt minimum levels of service to determine future infrastructure needs.

Imperial County must provide and maintain a highway system with adequate capacity and acceptable levels of service to accommodate projected travel demands associated with the projected population growth within the Land Use Element. This can be accomplished by establishing minimum service levels for the designated street and conventional state highway system. Strategies that result in improvements to the transportation system, coupled with local job creation, will allow County residents to have access to a wide range of job opportunities within reasonable commute times.

The County's goal for an acceptable traffic service standard on an ADT basis and during AM and PM peak periods for all County-Maintained Roads shall be LOS C for all street segment links and intersections. These service values are defined by the 1985 or 2000 edition of the *Highway Capacity* Manual or any subsequent edition thereof. This policy

shall acknowledge that the aforementioned level of service standards may not be obtainable on some existing facilities where abutting development precludes acquisition of additional right-of-way needed for changes in facility classification.

In order to achieve the level of service goals in the previous policy, the County shall develop and institute a long-range funding program in which new land development shall bear the major burden of the associated costs and improvement requirements.

**e. Design Standards**

The County shall adopt design standards for all streets in accordance with their functional classifications and recognized design guidelines. In developing these standards, the County shall consider the design standards of Caltrans and the American Association of State and Highway Transportation Officials (AASHTO). All streets within the County shall be designed in accordance with the adopted County of Imperial Design Standards. Typical cross sections and design criteria for the various street classifications are shown as an attachment to this document.

**f. Private Streets**

The County may permit construction of private streets within individual development projects (gated community). providing the following are addressed:

- They are designed geometrically and structurally to meet County standards.
- Only project occupants are served (gated community).
- Emergency vehicle access requirements are satisfied.
- The streets do not provide a direct through route between public streets.
- The Homeowners Associations and/or property owners provide an acceptable program for financing regular street maintenance.
- If the private street is permitted with a waiver of any of the above standards, any future requests to make the private street a public street shall require that all adjacent property owners provide and pay for all improvements and right of way required to bring the street to current public street or road standards. This includes road width, right of way widths and structural section. In no circumstance shall the County pay for any costs to upgrade a private street to public street standards if the above-mentioned requirements were waived at the request of the original developer or subdivider.

## **Appendix F**

### **Traffic Impact Significance Criteria from Imperial area EIRs**

## 4.6.2 Impact Significance Criteria

### Significance Criteria

The significance criteria summarized in Table 4.6-2 by Linscott, Law and Greenspan Engineers is based upon the City of El Centro and the County of Imperial's goal for intersections and roadway segments to operate at LOS C or better. In general, a degradation in LOS from LOS C or better to LOS D or worse is considered a significant direct impact. A cumulative impact can occur if the intersection or segment LOS is already operating below City/County standards and the project increases the delay by more than 2 seconds or the v/c ratio by more than 0.02.

<b>Table 4.6-2 Significance Criteria</b>			
<b>INTERSECTIONS</b>			
<b>Existing</b>	<b>Existing + Project</b>	<b>Existing + Project + Cumulative Projects</b>	<b>Impact Type</b>
LOS <sup>1</sup> C or better	LOS C or better	LOS C or better	None
LOS C or better	LOS D or worse	-	Direct
LOS D	LOS E or F	-	Direct
LOS E	LOS F	-	Direct
Any LOS	Project does not degrade LOS and adds > 2.0 seconds of delay	LOS E or worse	Cumulative
Any LOS	Project does not degrade LOS and adds < 2.0 seconds of delay	Any LOS	None
<b>SEGMENTS</b>			
<b>Existing</b>	<b>Existing + Project</b>	<b>Existing + Project + Cumulative Projects</b>	<b>Impact Type</b>
LOS C or better	LOS C or better	LOS C or better	None
LOS C or better	LOS D or worse	-	Direct <sup>2</sup>
LOS D	LOS E or F	-	Direct
LOS E	LOS F	-	Direct
Any LOS	LOS E or worse and v/c <sup>3</sup> > 0.02	LOS E or worse	Cumulative
Any LOS	LOS E or worse and v/c <sup>3</sup> < 0.02	Any LOS	None

Source: Linscott, Law & Greenspan, Engineers (July 2004)

Notes:

1. LOS: Level of Service
2. Exception: post-project segment operation is D and intersections along segment are D or better, no significant impact.
3. V/C: Volume to Capacity Ratio

In addition the project would have a significant impact if:

- It would substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment).

In addition to the above listed projects, the Lerno/Verhaegen project was recently submitted and is currently starting the CEQA process. This project is listed for information purposes but cannot be analyzed in cumulative terms. The following is a brief description based on the limited information available for this project.

**Lerno-Verhaegen Specific Plan** is proposed to be a mixed-use development of 2,708 dwelling units. The project consists of 680 acres on the west side of the City of El Centro. The project includes a zone change, Tentative Map, an amendment of the City's General Plan and an annexation.

Individual traffic assignments were completed for each cumulative project. Figure 2-7 depicts the total cumulative project traffic volumes in the area. Figure 2-8 shows the existing + project + cumulative projects traffic volumes for the vicinity. Appendix D of this Mitigated Negative Declaration contains the individual cumulative project traffic assignments.

### ***Significance Criteria***

The significance criteria summarized in Table 2-7 by Linscott, Law and Greenspan, engineers is based upon the County of Imperial's goal for intersections and roadway segments to operate at LOS C or better. Intersections or segments operating at LOS D, E or F are unacceptable and therefore constitute a significant impact.

<b>Table 2-7 – Significance Criteria</b>			
<b>INTERSECTIONS</b>			
<b>Existing</b>	<b>Existing + Project</b>	<b>Existing + Project + Cumulative Projects</b>	<b>Impact Type</b>
LOS <sup>1</sup> C or better	LOS C or better	LOS C or better	None
LOS C or better	LOS D or worse	-	Direct
LOS D	LOS E or F	-	Direct
LOS E	LOS F	-	Direct
Any LOS	Project does not degrade LOS and adds > 2.0 seconds of delay	LOS E or worse	Cumulative
Any LOS	Project does not degrade LOS and adds < 2.0 seconds of delay	Any LOS	None
<b>SEGMENTS</b>			
<b>Existing</b>	<b>Existing + Project</b>	<b>Existing + Project + Cumulative Projects</b>	<b>Impact Type</b>
LOS C or better	LOS C or better	LOS C or better	None
LOS C or better	LOS D or worse	-	Direct <sup>2</sup>
LOS D	LOS E or F	-	Direct
LOS E	LOS F	-	Direct
Any LOS	LOS E or worse and v/c <sup>3</sup> > 0.02	LOS E or worse	Cumulative
Any LOS	LOS E or worse and v/c <sup>3</sup> < 0.02	Any LOS	None

Source: LL&G, July 2004.

#### ***Notes:***

1. LOS: Level of Service
2. Exception: post-project segment operation is D and intersections along segment are D or better, no significant impact.
3. V/C: Volume to Capacity Ratio

**TABLE 5-1  
SIGNIFICANCE CRITERIA**

INTERSECTIONS			
Existing	Existing + Project	Existing + Project + Cumulative Projects	Impact Type
LOS <sup>a</sup> C or better	LOS C or better	LOS C or better	None
LOS C or better	LOS D or worse	—	Direct
LOS D	LOS D and adds 2.0 seconds or more of delay	LOS D or worse	Cumulative
LOS D	LOS E or F	—	Direct
LOS E	LOS F	—	Direct
LOS F	LOS F and delay increases by $\geq 10.0$ seconds	LOS F	Direct
Any LOS	Project does not degrade LOS and adds 2.0 to 9.9 seconds of delay	LOS E or worse	Cumulative
Any LOS	Project does not degrade LOS and adds $< 2.0$ seconds of delay	Any LOS	None
SEGMENTS			
Existing	Existing + Project	Existing + Project + Cumulative Projects	Impact Type
LOS C or better	LOS C or better	LOS C or better	None
LOS C or better	LOS C or better and $v/c^b > 0.02$	LOS D or worse	Cumulative
LOS C or better	LOS D or worse	—	Direct
LOS D	LOS D and $v/c > 0.02$	LOS D or worse	Cumulative
LOS D	LOS E or F	—	Direct
LOS E	LOS F	—	Direct
LOS F	LOS F and $v/c$ increases by $> 0.09$	LOS F	Direct
Any LOS	LOS E or worse and $v/c$ 0.02 to 0.09	LOS E or worse	Cumulative
Any LOS	LOS E or worse and $v/c < 0.02$	Any LOS	None

**Source:** Linscott, Law & Greenspan, Engineers

**Footnotes:**

a. Level of Service

b. Volume to Capacity Ratio

## **Appendix G**

### **Excerpts from Imperial County Circulation Element**

## **CIRCULATION AND SCENIC HIGHWAYS ELEMENT**

**Prepared by:  
Imperial County Planning & Development Services Department  
801 Main Street  
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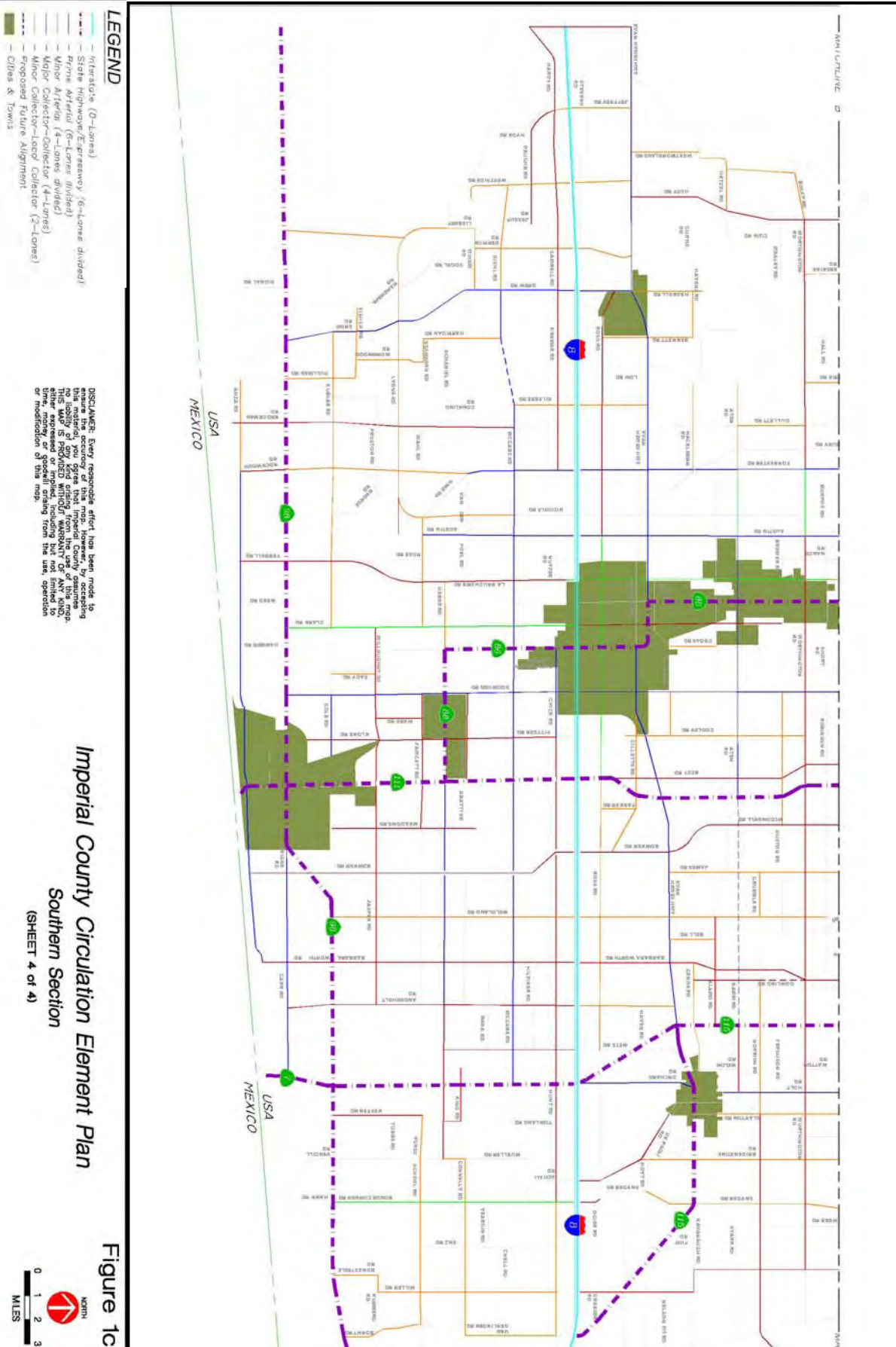
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**Imperial County Public Works Department  
155 South 11<sup>th</sup> Street  
El Centro, CA 92243**

**WILLIAM S. BRUNET, P.E.  
Director of Public Works**

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**Approved by:  
Board of Supervisors  
January 29, 2008**



**TABLE 3**  
**IMPERIAL COUNTY PROJECTED STREET SEGMENT CONFIGURATIONS AND VOLUMES**

Segment Location	2003 Classification	Year 2002 ADT Volume <sup>a</sup>	Year 2005 ADT Volume <sup>a</sup>	Year 2025 ADT Volume <sup>c</sup>	25 Year Total Growth Factor <sup>d</sup>	Year 2050 ADT Volume	Year 2050 Recommended Classification (# of Lanes)	2050 LOS <sup>e</sup>
<b>Alamo Road</b>								
Meloland/SR-115	Major Collector						Major Collector (4)	
<b>Albright Road</b>								
SR-111/SR-115	Minor Collector						Minor Collector (2)	
SR-115/Butters	Major Collector						Major Collector (4)	
<b>Anderholt Road</b>								
Evan Hewes (S-80)/Hunt	Minor Collector						Minor Collector (2)	
Hunt/Carr	Major Collector						Major Collector (4)	
<b>Andre Road</b>								
Forrester/End	Minor Collector						Minor Collector (2)	
<b>Anza Road</b>								
Pulliam/Rockwood	Local						Minor Collector (2)	
Rockwood/Calexico	Prime Arterial						Prime Arterial (6-divided)	
Calexico/Barbara Worth	Prime Arterial						Prime Arterial (6-divided)	
<b>Aten Road</b>								
End/Forrester	Minor Collector						Minor Collector (2)	
Forrester/Austin	Minor Arterial						Minor Arterial (6-divided)	
East Imperial City Limits/Dogwood	Prime Arterial	7,300	8,450	39,000	1.13	44,500	Prime Arterial (6-divided)	C
Dogwood/SR-111	Prime Arterial						Prime Arterial (6-divided)	
Proposed/SR-111/River	None						Prime Arterial (6-divided)	
<b>Austin Road</b>								
McCabe/Wahl	Local						Prime Arterial (6-divided)	
Proposed Wahl/SR-98	None						Prime Arterial (6-divided)	
Evan Hewes Hwy/McCabe	Major Collector						Prime Arterial (6-divided)	
Aten/Evan Hewes Hwy	Minor Arterial						Prime Arterial (6-divided)	
Keystone/Aten	Major Collector						Prime Arterial (6-divided)	
SR-86/Keystone	Minor Collector						Prime Arterial (6-divided)	
<b>Bannister Road</b>								
SR-86/Brandt	Major Collector						Major Collector (4)	
<b>Barbara Worth Road</b>								
Zenos/Evan Hewes (S-80)	Minor Collector						Major Collector (4)	
Evan Hewes Hwy/Anza	Major Collector						Major Collector (4)	
<b>Baughman Road</b>								
Garvey/Lack	Minor Collector						Minor Collector (2)	
Lack/SR-86	Major Collector						Major Collector (4)	
<b>Bell Road</b>								
Alamo/Evan Hewes Hwy	Minor Collector						Minor Collector (2)	
<b>Bennett Road</b>								
Havens/Ross	Minor Collector						Minor Collector (2)	
<b>Best Road</b>								
Rutherford/Brawley	Minor Arterial						Minor Arterial (4)	
<b>Blair Road</b>								
Pound/Sinclair	Minor Collector						Minor Collector (2)	
Peterson/Lindsey	Major Collector						Major Collector (4)	
Lindsey/SR-115	Major Collector						Major Collector (4)	
SR-115/Yocum	Local						Major Collector (4)	
<b>Blais Road</b>								
Wieman/Forrester	Minor Collector						Minor Collector	
<b>Boarts Road (S26)</b>								
Westmorland/Kalin	Major Collector						Major Collector (4)	
<b>Boley Road</b>								
Westmorland/Huff	Minor Collector						Minor Collector (2)	
<b>Bonds Corner Road</b>								
Holtville/I-8	Major Collector						Major Collector (4)	
I-8/SR-98	Minor Arterial						Minor Arterial (4)	
<b>Bonesteel Road</b>								
Kumberg/SR-98	Minor Collector						Minor Collector (2)	
<b>Bornt Road</b>								
Verde School/SR-98	Minor Collector						Minor Collector (2)	
<b>Bowker Road</b>								
Evan Hewes Hwy/I-8	Major Collector						Major Collector (4)	
I-8/SR-98	Minor Arterial						Expressway (6)	
SR-98/Anza	None						Minor Arterial (4)	

**TABLE 3**  
**IMPERIAL COUNTY PROJECTED STREET SEGMENT CONFIGURATIONS AND**  
**VOLUMES (continued)**

Segment Location	2003 Classification	Year 2002 ADT Volume <sup>a</sup>	Year 2005 ADT Volume <sup>a</sup>	Year 2025 ADT Volume <sup>c</sup>	25 Year Total Growth Factor <sup>d</sup>	Year 2050 ADT Volume	Year 2050 Recommended Classification (# of Lanes)	2050 LOS <sup>e</sup>
<b>Bowles Road</b>								
Riley/Lyerly	Minor Collector						Minor Collector (2)	
<b>Boyd Road</b>								
Wiest/SR-78	Local						Minor Collector (2)	
SR-115/Highline	Local						Minor Collector (2)	
Highline/End	Minor Collector						Minor Collector (2)	
<b>Brandt Road</b>								
Sinclair/Lindsey	Local						Minor Collector (2)	
Lindsey/Eddins	Minor Collector						Minor Collector (2)	
Eddins/Webster	Minor Collector						Minor Collector (2)	
<b>Bridenstein Road</b>								
Proposed SR-78/Hartshorn							Minor Collector (2)	
Hartshorn/Bonds Corner	Minor Collector						Minor Collector (2)	
<b>Brockman Road (S30)</b>								
McCabe/SR-98	Major Collector						Major Collector (4)	
<b>Butters Road (S32)</b>								
Gonder/SR-78	Prime Arterial						Prime Arterial (6)	A
Bowles/Albright	Local						Major Collector (4)	
Albright/SR-78	Major Collector						Major Collector (4)	
<b>Cady Road</b>								
Pellet/SR-86	Major Collector						Major Collector (4)	
<b>Cambell Road</b>								
Jessup/Derrick	Major Collector						Major Collector (4)	
Derrick/Drew	Major Collector						Major Collector (4)	
<b>Carey Road</b>								
SR-86/Dogwood	Minor Collector						Minor Collector (2)	
<b>Carr Road</b>								
Barbara Worth/SR-7	Major Collector						Minor Arterial (4)	
<b>Carter Road</b>								
Kalin/Forrester	Minor Collector						Major Collector (4)	
<b>Casey Road</b>								
Dickerman/SR-78	Minor Collector						Minor Collector (2)	
SR-78/Worthington	Minor Collector						Major Collector (4)	
Proposed Worthington/Norrish	None						Major Collector (4)	
<b>Chick Road</b>								
El Centro/Pitzer	Prime Arterial						Prime Arterial (6)	
Pitzer/Barbara Worth	Major Collector						Major Collector (4)	
<b>Clark Road</b>								
El Centro/SR-98	Minor Arterial						Minor Arterial (4)	
North El Centro City Limits/Worthington	Major Collector	2,100	2,430	12,550	1.64	21,000	Major Collector (4)	B
Worthington/Larsen	Minor Collector	800	930	6,220	1.64	10,500	Major Collector (4)	A
<b>Cole Road</b>								
Dogwood/Calexico	Prime Arterial						Prime Arterial (6-divided)	
East Calexico City Limits/SR-98	Minor Arterial	9,700	11,230	18,340	1.64	30,500	Prime Arterial (6-divided)	B
<b>Connelly Road</b>								
Vencill/Van Der Linden	Minor Collector						Minor Collector (2)	
<b>Cooley Road</b>								
Worthington/Gillett	Minor Collector						Minor Collector (2)	
<b>Corn Road</b>								
Bowles/Eddins	Minor Collector						Minor Collector (2)	
<b>Correll Road</b>								
Dogwood/SR 111	Minor Arterial						Minor Arterial (4)	
<b>Cross Road</b>								
Imperial (City)/Villa	Minor Collector						Minor Collector (2)	
<b>Davis Road</b>								
Gillespie/Schrimp	Major Collector						Major Collector (4)	
Proposed Schrimp/Sinclair	Major Collector						Major Collector (4)	
<b>Dearborn Road</b>								
Harrigan/Wormwood	Minor Collector						Minor Collector (2)	
<b>Derrick Road</b>								
Evan Hewes Hwy/Wixom	Minor Collector						Minor Collector (2)	
<b>Dickerman Road</b>								
SR-115/Butters	Minor Collector						Minor Collector (2)	

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**VOLUMES (continued)**

Segment Location	2003 Classification	Year 2002 ADT Volume <sup>a</sup>	Year 2005 ADT Volume <sup>a</sup>	Year 2025 ADT Volume <sup>c</sup>	25 Year Total Growth Factor <sup>d</sup>	Year 2050 ADT Volume	Year 2050 Recommended Classification (# of Lanes)	2050 LOS <sup>e</sup>
<b>Diehl Road</b>								
Westside/Drew	Minor Collector						Minor Collector (2)	
Drew/Harrigan	Major Collector						Prime Arterial (6)	
Proposed Harrigan/Silsbee	Major Collector						Prime Arterial (6)	
<b>Dietrich Road</b>								
Rutherford/Shank	Minor Collector						Major Collector (4)	
Proposed Shank/SR-78	None						Major Collector (4)	
<b>Doetsch Road</b>								
Elder/SR-86	Minor Collector						Minor Collector (2)	
<b>Dogwood Road (S31)*</b>								
Proposed Lindsey/Hovley	None						Prime Arterial (6-divided)	
Brawley/SR-98	Prime Arterial						Prime Arterial (6-divided)	
<b>Dowden Road</b>								
Proposed Forrester/Gentry	None						Local Collector (2)	
Gentry/Kershaw	None						Prime Arterial (6)	
Kershaw/Butters	Minor Collector						Prime Arterial (6)	
<b>Drew Road (S29)</b>								
Evan Hewes/SR-98	Prime Arterial						Prime Arterial (6-divided)	
<b>Dunaway Road</b>								
I-8/Evan Hewes Hwy	Major Collector	900	1,040	2,756	1.64	4,500	Major Collector (4)	A
<b>Eady Road</b>								
Willoughby/Cole	Minor Collector						Minor Collector (2)	
<b>Eddins Road (S30)</b>								
Gentry/SR-111(Calipatria City Limits)	Major Collector						Major Collector (4)	
<b>Edgar Road</b>								
Pierle/Forrester	Minor Collector						Minor Collector (2)	
<b>Elder Road</b>								
Doetsch/Cady	Minor Collector						Minor Collector (2)	
<b>English Road</b>								
Sinclair/Wilkins	Minor Collector						Minor Collector (2)	
<b>Erskine Road</b>								
Wheeler/Payne	Minor Collector						Minor Collector	
<b>Evan Hewes Hwy (S80)</b>								
Imperial Hwy/El Centro	Prime Arterial						Prime Arterial (6-divided)	
El Centro/SR-115	Prime Arterial						Prime Arterial (6-divided)	
SR-115/End	Prime Arterial						Prime Arterial (6-divided)	
<b>Fawcett Road</b>								
Dogwood/Meadows	Minor Collector						Major Collector (4)	
<b>Ferrell Road</b>								
Kubler/SR-98	Major Collector						Major Collector (4)	
SR-98/Anza	Minor Collector						Minor Collector (2)	
<b>Fiffield Road</b>								
SR-78/Streiby	Minor Collector						Minor Collector (2)	
<b>Fisher Road</b>								
Drew/Pulliam	Minor Collector						Minor Collector (2)	
<b>Flett Road</b>								
Wilkinson/Wirt	Minor Collector						Minor Collector (2)	
<b>Forrester Road (S30)</b>								
Proposed Sinclair/Walker	None						Prime Arterial (6-divided)	
Walker/Westmorland	Major Collector						Prime Arterial (6-divided)	
Westmorland/McCabe	Prime Arterial						Prime Arterial (6-divided)	
McCabe/Hime	Minor Collector						Prime Arterial (6-divided)	
Proposed Hime/River	Minor Collector						Prime Arterial (6-divided)	
North Westmorland City Limits/Gentry	Major Collector	1,200	1,390	9,000	1.64	15,000	Prime Arterial (6-divided)	A
<b>Foulds Road</b>								
Pellet/Lack	Minor Collector						Minor Collector (2)	
<b>Fredericks Road</b>								
Loveland/SR-111	Minor Collector						Minor Collector (2)	
<b>Frontage Road</b>								
Ross/Brawley (City)	Major Collector						Major Collector (4)	
<b>Garst Road</b>								
Sinclair/McDonald	Minor Collector						Minor Collector (2)	
<b>Garvey Road</b>								
Baughman/Andre	Minor Collector						Minor Collector (2)	

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<b>Gentry Road</b>								
Sinclair/Walker	Major Collector						Major Collector (4)	
<b>Gillespie Road</b>								
Davis/Wilkins	Minor Collector						Minor Collector (2)	
<b>Gillett Road</b>								
Cooley/Bowker	Minor Collector						Minor Collector (2)	
<b>Gonder Road</b>								
Proposed New River/SR-115	None						Major Collector (4)	
SR-115/Butters	Local						Minor Collector (2)	
Butters/Green	Minor Collector						Minor Collector (2)	
Green/Highline	Major Collector						Major Collector (4)	
<b>Gowling Road</b>								
Norrish/Zenos	Minor Collector						Major Collector (4)	
<b>Green Road</b>								
SR-78/Gonder	Major Collector						Major Collector (4)	
<b>Griffin Road</b>								
Wiest/SR-115	Minor Collector						Minor Collector (2)	
<b>Grumbles Road</b>								
James/Meloland	Minor Collector						Minor Collector (2)	
<b>Gullett Road</b>								
Worthington/Aten	Minor Collector						Minor Collector (2)	
<b>Gutherie Road</b>								
Wiener/Worthington	Minor Collector						Minor Collector (2)	
Proposed Worthington/Hackleman	Minor Collector						Minor Collector (2)	
<b>Hackleman Road</b>								
Low/Forrester	Minor Collector						Minor Collector (2)	
<b>Hardy Road</b>								
Dunaway/Jeffrey	Major Collector						Major Collector (4)	
Jeffrey/Hyde	Major Collector						Major Collector (4)	
Hyde/Jessup	Major Collector						Major Collector (4)	
<b>Harrigan Road</b>								
Diehl/Dearborn	Minor Collector						Minor Collector (2)	
<b>Harris Road</b>								
Austin/SR-86	Local						Major Collector (4)	
SR-86/McConnel	Major Collector						Major Collector (4)	
McConnell/Highline	Minor Collector						Major Collector (4)	
<b>Hart Road</b>								
Wiest/SR-115	Minor Collector						Minor Collector (2)	
<b>Hartshorn Road</b>								
Bridenstein/Proposed Bridenstein	Minor Collector						Minor Collector	
<b>Haskell Road</b>								
Evan Hewes Hwy/End	Minor Collector						Minor Collector (2)	
<b>Hastain Road</b>								
Taecker/SR-78	Minor Collector						Minor Collector (2)	
Young/Dickerman	Minor Collector						Minor Collector (2)	
<b>Havens Road</b>								
Haskell/Bennett	Minor Collector						Minor Collector (2)	
<b>Hetzel Road</b>								
Westmorland/Huff	Minor Collector						Minor Collector (2)	
<b>Heber Road</b>								
La Brucherie/SR-86	Local						Minor Collector (2)	
SR-111/Anderholt	Minor Arterial	N/A	2,040	16,700	1.64	27,500	Prime Arterial (6-divided)	B
Anderholt/Keffner	Major Collector						Major Collector (4)	
Keffner/Vencill	Minor Collector						Major Collector (4)	
<b>Highline Road (S33)</b>								
Proposed SR-78/Gonder	None						Major Collector (4)	
Gonder/Kavanaugh	Major Collector						Major Collector (4)	
Proposed Kavanaugh/I-8	None						Major Collector (4)	
<b>Holt Road, (S32)</b>								
Gonder/Holtville city limits	Prime Arterial						Prime Arterial (6-divided)	
<b>Hoskins Road</b>								
SR-86/Steiner	Minor Collector						Minor Collector	
<b>Hovley Road</b>								
Rutherford/Brawley	Major Collector						Major Collector (4)	

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<b>Huff Road</b>								
Imler/Evan Hewes Hwy	Major Collector						Major Collector (4)	
<b>Hunt Road</b>								
Barbara Worth/Bonds Corner	Major Collector						Major Collector (4)	
Bonds Corner/Van Der Linden	Minor Collector						Minor Collector (2)	
<b>Huston Road</b>								
Dogwood/McConnell	Minor Collector						Minor Collector (2)	
<b>Imler Road</b>								
Huff/Forrester	Major Collector						Major Collector (4)	
<b>International Road</b>								
Noffsinger/Pound	Minor Collector						Minor Collector (2)	
<b>Irvine Road</b>								
Shank/End	Minor Collector						Minor Collector (2)	
<b>James Road</b>								
Ralph/Evan Hewes Hwy	Minor Collector						Minor Collector (2)	
<b>Jasper Road</b>								
Calexico/Anderholt	Major Collector						Expressway (6)	
Proposed Anderholt/ SR-7	None						Expressway (6)	
<b>Jeffery Road</b>								
Evan Hewes Hwy/Hardy	Minor Collector						Minor Collector (2)	
<b>Kaiser Road</b>								
Wirt/Albright	Minor Collector						Minor Collector (2)	
<b>Kalin (S26)</b>								
Sinclair/SR-78/86	Major Collector						Major Collector (4)	
SR-78/86/Webster	Minor Collector						Minor Collector (4)	
<b>Kamm Road</b>								
River/SR-115	Local						Prime Arterial (6)	
SR-115/Holt	Minor Collector						Major Collector (4)	
<b>Keffer Road</b>								
SR-98/King	Major Collector						Major Collector (4)	
<b>Kershaw Road</b>								
Yocum/Rutherford	Minor Collector						Minor Collector (2)	
<b>Keystone Road (S27)</b>								
Forrester/SR-111	Prime Arterial						Expressway (6)	
SR-111/Highline	Major Collector						Expressway (6)	
<b>King Road</b>								
Orchard/Keffer	Major Collector						Major Collector (4)	
<b>Kloke Road</b>								
Willoughby/Calexico	Major Collector						Major Collector (4)	
<b>Kramar Road</b>								
Drew/Forrester	Major Collector						Major Collector (4)	
<b>Kubler Road</b>								
Drew/Clark	Minor Collector						Minor Collector (2)	
<b>Kumberg Road</b>								
Bonesteel/Miller	Minor Collector						Minor Collector (2)	
<b>La Brucherie Road</b>								
El Centro city limits/Kubler	Major Collector						Major Collector (4)	
Larsen/Murphy	Minor Collector						Minor Collector (2)	
Murphy/Imperial city limits	Minor Collector						Minor Collector (2)	
<b>Lack Road</b>								
Lindsey/Blais	Minor Collector						Minor Collector (2)	
<b>Larsen Road</b>								
Forrester/SR-86	Major Collector						Major Collector (4)	
SR-86/Clark	Minor Collector						Minor Collector (2)	
<b>Lavigne Road</b>								
SR-98/Bowker	Prime Arterial						Prime Arterial (6)	
Proposed Bowker/Barbara Worth	Prime Arterial						Prime Arterial (6)	
<b>Liebert Road</b>								
Wixom/Rd 8018	Minor Collector						Minor Collector (2)	
Proposed Road 8018/SR-98	Minor Collector						Minor Collector (2)	
<b>Lindsey Road</b>								
Lack/Wiest	Minor Collector						Minor Collector (2)	
<b>Loveland Road</b>								
Fredericks/Monte	Minor Collector						Minor Collector (2)	
<b>Low Road</b>								
Hackleman/Evan Hewes Hwy	Minor Collector						Minor Collector (2)	

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<b>Lyerly Road</b>								
Bowles/Eddins	Minor Collector						Minor Collector (2)	
<b>Lyons Road</b>								
Drew/Nichols	Minor Collector						Major Collector (4)	
Proposed Nichols/La Brucherie	None						Major Collector (4)	
<b>Main ST (Niland)</b>								
SR-111/Blair	Major Collector						Major Collector (4)	
<b>Martin Road</b>								
Baughman/7th	Minor Collector						Minor Collector (2)	
7th/Bannister	Local						Minor Collector (2)	
<b>Mead Road</b>								
Dogwood/McConnell	Minor Collector						Minor Collector (2)	
<b>Meadows Road</b>								
Heber/Calexico (City)	Major Collector						Major Collector (4)	
<b>Meloland Road</b>								
Worthington/Correll	Minor Collector						Minor Collector (2)	
Proposed Correll/SR-98	Minor Collector						Minor Collector (2)	
<b>McCabe Road</b>								
Silsbee/La Brucherie	Major Collector						Prime Arterial (6-divided)	
La Brucherie/SR-111	Minor Arterial	N/A	200	17,270	1.64	28,500	Prime Arterial (6-divided)	B
SR-111/SR-7	Major Collector						Prime Arterial (6-divided)	
<b>McConnell Road</b>								
SR-78/Evan Hewes Hwy	Major Collector						Major Collector (4)	
<b>McDonald Road</b>								
Garst/SR-111	Minor Collector						Minor Collector (2)	
SR-111 TO Rd 8041	Minor Collector						Minor Collector (2)	
<b>McKim Road</b>								
Harris/Ralph	Minor Collector						Minor Collector (2)	
<b>Miller Road (S33)</b>								
I-8/Kumberg	Minor Collector						Minor Collector (2)	
I-8/SR-115	Major Collector	200	230	5,250	1.64	9,000	Major Collector (4)	A
SR-115/Kavanaugh	Major Collector	100	120	5,300	1.64	9,000	Major Collector (4)	A
<b>Monte Road</b>								
Pellet/Loveland	Minor Collector						Minor Collector (2)	
<b>Neckel Road</b>								
Austin/Clark	Minor Collector						Minor Collector (2)	
<b>Nichols Road</b>								
McCabe/Lyons	Minor Collector						Minor Collector (2)	
<b>Noffsinger Road</b>								
SR-111/McDonald	Minor Collector						Minor Collector (2)	
<b>Norrish Road</b>								
Gowling/Holt	Minor Collector						Minor Collector (2)	
Holt/Highline	Local						Major Collector (4)	
Highline/End	Major Collector						Major Collector (4)	
<b>Orchard Road (S32)/ SR 7</b>								
King/McCabe	Major Collector	700	810	50,740	1.13	57,500	Expressway (6)	C
McCabe/I-8	Major Collector	900	1,040	49,000	1.13	56,000	Expressway (6)	C
Holtville/I-8	Minor Arterial						Prime Arterial (6-divided)	
I-8/Connelly	Major Collector						Major Collector (4)	
<b>Orr Road</b>								
Baughman/SR-86	Minor Collector						Minor Collector (2)	
<b>Park Road</b>								
Proposed Dowden/Williams	None						Major Collector (4)	
Williams/Rutherford	Minor Collector						Major Collector (4)	
Proposed Rutherford/Dietrich	None						Major Collector (4)	
<b>Parker Road</b>								
Ross/Gilllett	Minor Collector						Minor Collector (2)	
<b>Payne Road</b>								
Huff/Erskine	Minor Collector						Minor Collector (2)	
<b>Pellet Road</b>								
Foulds/Monte	Minor Collector						Minor Collector (2)	
Proposed Monte/Imler	Minor Collector						Minor Collector (2)	
<b>Pickett Road</b>								
Hastain/Butters	Minor Collector						Minor Collector (2)	

**TABLE 3**  
**IMPERIAL COUNTY PROJECTED STREET SEGMENT CONFIGURATIONS AND**  
**VOLUMES (continued)**

Segment Location	2003 Classification	Year 2002 ADT Volume <sup>a</sup>	Year 2005 ADT Volume <sup>a</sup>	Year 2025 ADT Volume <sup>c</sup>	25 Year Total Growth Factor <sup>d</sup>	Year 2050 ADT Volume	Year 2050 Recommended Classification (# of Lanes)	2050 LOS <sup>e</sup>
<b>Pierle Road</b>								
Edgar/Wheeler	Minor Collector						Minor Collector (2)	
<b>Pitzer Road</b>								
Proposed Jasper/Willoughby	None						Major Collector (4)	
Chick/SR-86	Major Collector						Major Collector (4)	
SR-86/Jasper	Minor Collector						Major Collector (4)	
<b>Pound Road</b>								
Davis/International	Major Collector						Major Collector (4)	
International/Noffsinger	Minor Collector						Minor Collector (2)	
<b>Pulliam Road</b>								
Fisher/ SR-98	Minor Collector						Minor Collector (2)	
<b>Ralph Road</b>								
Imperial (City)/Dogwood	Major Collector						Major Collector (4)	
Dogwood/Mckim	Minor Collector						Minor Collector (2)	
<b>Riley Road</b>								
Bowles/Eddins	Minor Collector						Minor Collector	
<b>Rockwood Road</b>								
Proposed River/Lyons	Minor Collector						Prime Arterial (6)	
Lyons SR-98	Minor Collector						Prime Arterial (6)	
SR-98/Anza	Major Collector						Major Collector	
<b>Ross Road</b>								
Drew/Bennett	Major Collector	1,500	1,740	2,310	1.64	4,000	Major Collector (4)	A
Drew/Austin	Major Collector						Major Collector (4)	
El Centro/SR-111	Minor Arterial						Minor Arterial (4)	
SR-111/Mets	Local	N/A	560	2,120	1.64	3,500	Minor Collector (2)	B
<b>Ruegger Road</b>								
Kalin/SR-111	Minor Collector						Minor Collector (2)	
<b>Rutherford Road (S26)</b>								
Proposed Banister/Kalin							Major Collector (4)	
Kalin/Butters	Major Collector						Major Collector (4)	
Butters/Irvine	Minor Collector						Minor Collector (2)	
<b>Schartz Road</b>								
Proposed SR-86/Dogwood	None						Major Collector (4)	
Dogwood/McConnell	Minor Collector						Major Collector (4)	
Proposed McConnell/River	None						Major Collector (4)	
<b>Seybert Road</b>								
Taecker/SR-78	Minor Collector						Minor Collector	
<b>Shank Road</b>								
Best/SR-115	Minor Arterial						Minor Arterial (4)	
SR-115/Irvine	Minor Collector						Minor Collector (2)	
<b>Silsbee Road</b>								
Evan Hewes Hwy/McCabe	Minor Collector						Minor Collector (2)	
<b>Sinclair Road</b>								
Gentry/SR-111	Major Collector						Prime Arterial (6-divided)	
SR-111/Weist	Minor Collector						Minor Collector (2)	
<b>Slayton Road</b>								
Worthington/Holtville (City)	Minor Collector						Minor Collector (2)	
<b>Snyder Road</b>								
Worthington/Bonds Corner Road	Minor Collector						Minor Collector (2)	
<b>Stahl Road</b>								
McConnell/End	Minor Collector						Minor Collector (2)	
<b>Streiby Road</b>								
Fifield/Wiest	Minor Collector						Minor Collector (2)	
<b>Taecker Road</b>								
Seybert/Hastain	Minor Collector						Minor Collector (2)	
<b>Titworth Road</b>								
Butters/End	Minor Collector						Minor Collector (2)	
<b>Townsend Road</b>								
SR-115/Holt	Minor Collector						Minor Collector (2)	
<b>Vail Road</b>								
Lack/Kalin	Minor Collector						Minor Collector (2)	
<b>Van Der Linden</b>								
Hunt/Connelly	Minor Collector						Minor Collector (2)	
<b>Vencill Road</b>								
Connelly/Heber	Minor Collector						Minor Collector (2)	

**TABLE 3**  
**IMPERIAL COUNTY PROJECTED STREET SEGMENT CONFIGURATIONS AND**  
**VOLUMES (continued)**

Segment Location	2003 Classification	Year 2002 ADT Volume <sup>a</sup>	Year 2005 ADT Volume <sup>a</sup>	Year 2025 ADT Volume <sup>c</sup>	25 Year Total Growth Factor <sup>d</sup>	Year 2050 ADT Volume	Year 2050 Recommended Classification (# of Lanes)	2050 LOS <sup>e</sup>
<b>Verde School Road</b>								
Keffer/Bornt	Minor Collector						Minor Collector (2)	
<b>Villa Road</b>								
Dogwood/Cooley	Minor Collector						Minor Collector (2)	
<b>Wahl Road</b>								
Nichols/Clark	Minor Collector						Minor Collector (2)	
<b>Walker Road</b>								
Gentry/End	Major Collector						Major Collector (4)	
Gentry/Brandt	Minor Collector						Minor Collector (2)	
<b>Ware Road</b>								
Fawcett/Willoughby	Major Collector						Major Collector (4)	
<b>Weaver Road</b>								
Kalin/SR-86	Minor Collector						Minor Collector (2)	
<b>Webster Road</b>								
Kalin/Brandt	Minor Collector						Minor Collector (2)	
<b>Westmorland Road</b>								
Boley/Evan Hewes Hwy	Minor Collector						Minor Collector (2)	
<b>Westside Road</b>								
Evan Hewes Hwy/End	Minor Collector						Minor Collector (2)	
<b>Wheeler Road</b>								
Erskine/Pierle	Minor Collector						Minor Collector (2)	
<b>Wieman Road</b>								
Steiner/Cady	Minor Collector						Minor Collector (2)	
<b>Wienert Road</b>								
Guthrie/Forrester	Minor Collector						Minor Collector (2)	
<b>Wiest Road</b>								
SR-78/Griffin	Minor Collector						Minor Collector (2)	
Griffin/Boyd	Local						Minor Collector (2)	
McDonald/SR-115	Minor Collector						Minor Collector (2)	
<b>Wilkins Road</b>								
English/Cuff	Minor Collector						Minor Collector (2)	
<b>Wilkinson Road</b>								
Brandt/SR-111	Minor Collector						Minor Collector (2)	
Wiest/Flett	Minor Collector						Minor Collector (2)	
<b>Willoughby Road</b>								
Proposed La Brucherie/Clark	none						Major Collector (4)	
Clark/Dogwood	Minor Collector						Major Collector (4)	
Dogwood/Kloke	Major Collector						Major Collector (4)	
<b>Wirt Road</b>								
Wiest/Kaiser	Minor Collector						Minor Collector (2)	
<b>Wixom Road</b>								
Liebert/Drew	Minor Collector						Minor Collector (2)	
<b>Wormwood Road</b>								
Dearborn/Fisher	Minor Collector						Minor Collector (2)	
<b>Worthington Road (S28)</b>								
Huff/Highline	Major Collector						Major Collector (4)	
<b>Yocum Road</b>								
Proposed Dogwood/Lyerly	none						Major Collector (2)	
Lyerly/Kershaw	Minor Collector						Major Collector (4)	
Kershaw/Blair	Local						Major Collector (4)	
<b>Young Road</b>								
SR-111/Blair	Minor Collector						Minor Collector (2)	
<b>Zenos Road</b>								
Barbara Worth/Holtville (City)	Minor Collector						Minor Collector (2)	
<b>State Route 78</b>								
S.D.-Imperial County Line/Junction SR-86	State Hwy	N/A	920	8,104	1.64	13,500	Collector (4)	A
SR-111/SR-115N	State Hwy	N/A	3,950	10,592	1.64	17,500	Collector (4)	B
SR-115N/SR-115S	State Hwy	N/A	3,100	13,447	1.64	22,500	Collector (4)	B
115S/Glamis	State Hwy	N/A	1,950	7,340	1.64	12,500	Collector (4)	A
Glamis/Ogilby	State Hwy	N/A	1,850	4,909	1.64	8,500	Collector (4)	A
Ogilby/Palo Verde, Fourth	State Hwy	N/A	2,000	5,307	1.64	9,000	Collector (4)	A
Palo Verde, Fourth/Imperial County Line	State Hwy	N/A	2,000	5,307	1.64	9,000	Collector (4)	A

**TABLE 3**  
**IMPERIAL COUNTY PROJECTED STREET SEGMENT CONFIGURATIONS AND**  
**VOLUMES (continued)**

Segment Location	2003 Classification	Year 2002 ADT Volume <sup>a</sup>	Year 2005 ADT Volume <sup>a</sup>	Year 2025 ADT Volume <sup>c</sup>	25 Year Total Growth Factor <sup>d</sup>	Year 2050 ADT Volume	Year 2050 Recommended Classification (# of Lanes)	2050 LOS <sup>e</sup>
<b>State Route 86</b>								
Imperial County Line/Desert Shores	State Hwy	N/A	12,900	21,138	1.28	27,500	Minor Arterial (4)	C
Desert Shores/Brawley Ave.	State Hwy	N/A	12,400	20,319	1.28	26,500	Collector (4)	C
Brawley Ave./S. Marina	State Hwy	N/A	13,400	21,957	1.28	28,500	Minor Arterial (4)	C
S. Marina/Air Park	State Hwy	N/A	12,100	19,827	1.64	33,000	Prime Arterial (6-divided)	B
Air Park/SR-78 West	State Hwy	N/A	10,800	17,697	1.64	29,500	Minor Arterial (4)	C
SR-78 West/Lack	State Hwy	N/A	10,800	17,890	1.64	29,500	Minor Arterial (4)	C
Lack/West Westmorland City Limits	State Hwy	N/A	10,200	19,650	1.64	32,500	Prime Arterial (6-divided)	B
E Westmorland C. Limits/W Brawley C. Limits	State Hwy	N/A	14,000	19,440	1.64	32,000	Prime Arterial (6-divided)	B
South Brawley City Limits/Legion	State Hwy	N/A	21,400	28,300	1.13	32,500	Prime Arterial (6-divided)	B
Legion/Keystone	State Hwy	N/A	19,100	27,940	1.13	32,000	Prime Arterial (6-divided)	B
Keystone/Imperial Ave.	State Hwy	N/A	14,700	27,980	1.13	32,000	Prime Arterial (6-divided)	B
I-8/McCabe	State Hwy	N/A	21,500	24,890	1.28	32,000	Prime Arterial (6-divided)	B
McCabe/Heber	State Hwy	N/A	7,100	26,100	1.28	33,500	Prime Arterial (6-divided)	B
Heber/Dogwood	State Hwy	N/A	7,500	26,100	1.28	33,500	Prime Arterial (6-divided)	B
Dogwood/SR-111	State Hwy	N/A	5,200	26,000	1.28	33,500	Prime Arterial (6-divided)	B
South Imperial City Limits/North El Centro City Limits	State Hwy	N/A	6,500	27,980	1.13	32,000	Prime Arterial (6-divided)	B
<b>State Route 98</b>								
Imperial Hwy/Drew	State Hwy	N/A	2,300	1,730	1.64	3,000	Local Collector (2)	B
Drew/Clark	State Hwy	N/A	3,800	5,350	1.64	9,000	Collector (4)	A
Clark/Dogwood	State Hwy	N/A	4,550	8,800	1.64	14,500	Collector (4)	B
Dogwood/West Calexico City Limits	State Hwy	N/A	9,800	24,180	1.64	31,500	Prime Arterial (6-divided)	B
East Calexico City Limits/Barbara Worth	State Hwy	N/A	24,400	26,000	1.64	33,500	Prime Arterial (6-divided)	B
Barbara Worth/Bonds Corner	State Hwy	N/A	16,300	26,000	1.64	33,500	Prime Arterial (6-divided)	B
Bonds Corner/E. Highline Canal	State Hwy	N/A	4,500	770	1.64	1,500	Local Collector (2)	A
E. Highline Canal/I-8	State Hwy	N/A	2,200	250	1.64	500	Local Collector (2)	A
<b>State Route 111</b>								
North Calexico City Limits	State Hwy	N/A	50,000	97,570	1.13	111,000	Freeway (8)	C
Heber/McCabe	State Hwy	N/A	33,500	98,650	1.13	112,000	Freeway (8)	C
McCabe/I-8	State Hwy	N/A	37,000	90,830	1.13	103,000	Freeway (8)	C
I-8/Evan Hewes Hwy	State Hwy	N/A	16,300	52,980	1.13	60,500	Expressway (6)	D
Evan Hewes/Aten	State Hwy	N/A	14,100	60,200	1.13	68,500	Expressway (6)	D
Aten/Worthington	State Hwy	N/A	11,300	58,160	1.13	66,000	Expressway (6)	D
Worthington/Keystone	State Hwy	N/A	10,600	58,710	1.13	67,000	Expressway (6)	D
Keystone/E. Junction 78	State Hwy	N/A	9,300	57,590	1.13	65,500	Expressway (6)	D
North Brawley City Limits/Rutherford	State Hwy	N/A	9,500	18,510	1.64	30,500	Prime Arterial (6-divided)	B
Rutherford/South Calipatria City Limits	State Hwy	N/A	6,600	18,560	1.64	30,500	Prime Arterial (6-divided)	B
North Calipatria City Limits/Sinclair	State Hwy	N/A	5,700	15,640	1.64	26,000	Minor Arterial (4)	C
Sinclair/Niland Ave	State Hwy	N/A	5,100	13,532	1.64	22,500	Collector (4)	B
Niland Ave/English	State Hwy	N/A	3,700	9,817	1.64	16,500	Collector (4)	B
English/Bombay Beach	State Hwy	N/A	2,300	6,103	1.64	10,500	Collector (4)	A
Bombay Beach/Imperial-Riverside County line	State Hwy	N/A	1,900	5,041	1.64	8,500	Collector (4)	A
<b>State Route 115</b>								
Junction I-8/East Holtville City Limits	State Hwy	N/A	1,850	4,140	1.64	7,000	Local Collector (2)	C
West Holtville City Limits/West Junction Evan Hewes Hwy	State Hwy	N/A	6,600	8,320	1.64	14,000	Collector (4)	B
West Junction Evan Hewes Hwy/SR-78	State Hwy	N/A	2,850	27,870	1.13	32,000	Prime Arterial (6-divided)	B
SR-78/Rutherford	State Hwy	N/A	990	13,450	1.64	22,500	Minor Arterial (4)	B
Rutherford/Wirt	State Hwy	N/A	1,650	9,720	1.64	16,000	Collector (4)	B
Wirt/East Calipatria City Limits	State Hwy	N/A	1,150	9,240	1.64	15,500	Collector (4)	B
<b>State Route 186</b>								
I-8/International Border	State Hwy	N/A					State Hwy	

Notes:

\* See Table 1 regarding additional right-of-way for transit facility with roadway.

a. Volume from Imperial County Circulation and Scenic Highways Element Manual (Dec. 2003).

b. Volume from Caltrans, Imperial County, or Linscott Law & Greenspan, Engineers counts.

c. Volumes from Caltrans CalxGP+ Model and adjusted higher in some cases.

d. A 0.5%, 1.0%, or 2.0% annual growth rate was applied to the Year 2025 volumes to obtain Year 2050 volumes.

e. Capacity based on the Imperial County Classification Table (depending on the Year 2050 volume amount).

## PEAK HOUR VOLUME DATA

Peak hour volume data consists of hourly volume relationships and data location. The hourly volumes are expressed as a percentage of the Annual Average Daily Traffic (AADT). The percentages are shown for both the AM and the PM peak periods.

The principle data described here are the K factor, the D factor and their product (KD). The K factor is the percentage of AADT during the peak hour for both directions of travel. The D factor is the percentage of the peak hour travel in the peak direction. KD multiplied with the AADT gives the one way peak period directional flow rate or the design hourly volume (DHV). The design hourly volume is used for either Operational Analysis or Design Analysis. Refer to the 2000 Highway Capacity Manual for more details.

Following is a glossary of terms used in this listing of peak hour volume data:

Dir	Indicates direction of travel for peak volume
AADT	Annual Average Daily Traffic in vehicles per day (vpd).
AM Peak	Represents the morning peak period for traffic analysis
CS	Control Station Number, Caltrans identification number for monitoring site.
CO	County abbreviation used by Caltrans
D	D factor. The percentage of traffic in the peak direction during the peak hour. Values in this book are derived by dividing the measured PHV by the sum of both directions of travel during the peak hour.
DAY	Day of week for the peak volume.
DDHV	The directional design hour volume, in vehicles per hour (vph) $DDHV = AADT \times K \times D$ . See equation (8-1) on page 8-11 of the 2000 Highway Capacity Manual.
DI	Caltrans has twelve transportation districts statewide. This abbreviation identifies the district in which the count station is located.
HR	The ending time for the peak hour volume listed. The volume observed from 1 to 2 would be recorded as 2.

K	The percentage of the AADT in both directions during the peak hour. Values in this table are derived by dividing the measured 2-way PHV by the AADT.
KD	The product of K and D. The percentage of AADT in the peak direction during the peak hour. Values in this table are derived by dividing the measured 1-way PHV by the AADT.
LEG	For traffic counting purposes, a highway intersection or interchange is assigned two legs according to increasing postmiles (route direction) and with a postmile reference at the center of the intersection or interchange. The volume of traffic on each leg is denoted by an A, B or O. A = ahead leg, B = back leg, and O – traffic volume being same for both back and ahead legs.
MNTH	The month that the peak volume occurred.
PHV	Peak Hour Volume in the peak direction. A one way volume in vehicles per hour (vph) as used here. The PHV is analogous to the DDHV as used for design purposes.
PM	The Post Mile is the mileage measured from the county line, or from the beginning of a route. Each postmile along a route in a county is a unique location on the state highway system.
PM Peak	Represents the afternoon peak period for traffic analysis.
PRE	The postmile may have a prefix like R, T, L, M, etc. When a length of highway is changed due to construction or realignment, new postmile values are assigned. To distinguish the new values from the old, an alpha code is prefixed to the new postmile.
RTE	The state highway route number
YR	The year when the count was made. Traffic counting is on a 3-year cycle.

DI	RTE	CO	PRE	PM CS		LEG	YR	Dir	AM PEAK					PM PEAK					HR	DAY	Mnth		
									1 WAY	%	%	%	1 WAY	%	%	%							
									PHV	K	D	KD	HR	DAY	Mnth	Dir	PHV	K	D	KD	HR	DAY	Mnth
11	008	SD	L	1.213	958	A	08	E	4637	7.47	61.45	4.59	7	TUE	FEB	W	4604	8.33	54.73	4.56	17	FRI	AUG
11	008	SD		.946	804	A	08	W	8170	7.41	57.07	4.23	7	THU	SEP	E	8446	8.02	54.48	4.37	16	TUE	MAR
11	008	SD		5.638	953	B	08	W	11617	7.43	64.73	4.81	7	TUE	APR	E	10959	7.96	56.96	4.53	15	THU	DEC
11	008	SD		8.336	807	B	08	W	11072	8.06	60.93	4.91	7	THU	NOV	E	10737	8.02	59.36	4.76	15	WED	OCT
11	008	SD		8.336	808	A	08	W	10170	7.6	67.39	5.12	7	THU	MAY	E	9780	7.99	61.61	4.92	16	FRI	JAN
11	008	SD		11.76	810	B	08	W	8307	6.82	63.17	4.31	7	THU	JAN	E	9011	8.24	56.73	4.67	16	WED	FEB
11	008	SD		14.59	806	B	07	W	8456	6.87	59.41	4.08	7	THU	OCT	E	9132	8.15	54.13	4.41	15	THU	DEC
11	008	SD	R	18.73	824	B	08	W	4555	7.07	69.67	4.93	7	TUE	OCT	E	4273	8.06	57.38	4.62	15	TUE	NOV
11	008	SD	R	20.04	888	B	08	W	3944	7.07	69.41	4.9	7	TUE	MAR	E	3787	8.05	58.53	4.71	17	FRI	APR
11	008	SD	R	23.64	979	O	08	W	2444	7.79	55.9	4.35	12	FRI	DEC	W	2926	8.57	60.81	5.21	17	WED	NOV
11	008	SD	R	37.83	811	A	08	E	1143	8.94	64.36	5.76	10	FRI	NOV	W	1404	11.46	61.69	7.07	15	WED	DEC
11	008	SD	R	51.98	621	B	08	E	999	11.26	56.73	6.39	11	THU	NOV	W	1284	12.29	66.81	8.21	14	MON	FEB
11	008	SD	R	65.90	981	A	08	E	1001	12.07	59.55	7.19	10	WED	DEC	E	1189	14.5	58.86	8.53	16	SUN	JUL
11	008	IMP	R	10.29	993	B	08	W	984	11.35	61.85	7.02	11	MON	FEB	W	1180	12.22	68.89	8.42	15	TUE	JAN
11	008	IMP	R	10.29	994	A	08	E	914	14.57	51.55	7.51	12	MON	MAY	W	1079	12.69	69.84	8.87	15	TUE	JAN
11	008	IMP	R	23.48	624	A	08	W	872	9.63	73.84	7.11	9	FRI	JUL	W	1038	15.17	55.81	8.46	15	MON	MAY
11	008	IMP	R	36.97	982	B	08	E	1034	10.76	53	5.7	12	SAT	DEC	W	1215	10.94	61.24	6.7	15	SAT	NOV
11	008	IMP	R	40.94	638	B	08	W	1401	8.35	53.37	4.46	12	MON	MAY	E	1805	9.17	62.63	5.74	18	FRI	MAY
11	008	IMP	R	53.50	964	A	08	E	909	12.78	61.21	7.82	10	SAT	DEC	W	1018	15.25	57.42	8.76	13	SAT	NOV
11	008	IMP	R	96.55	995	B	08	E	1276	12.1	54.39	6.58	12	FRI	FEB	E	1300	10.71	62.65	6.71	13	MON	SEP
11	008	IMP	R	96.99	988	B	08	E	1097	11.54	56.58	6.53	12	MON	JAN	E	1173	11.9	58.71	6.98	15	MON	FEB
05	009	SCR		.63	681	A	08	S	380	8.29	91.79	7.61	8	TUE	DEC	S	390	8.27	94.43	7.81	17	MON	DEC
05	009	SCR		8.11	430	B	08	S	1364	8.35	78.89	6.58	7	THU	MAR	N	1250	9.09	66.38	6.03	17	TUE	DEC
05	009	SCR		13.04	169	B	08	N	731	9.14	64.92	5.93	10	WED	DEC	N	643	8.85	58.99	5.22	17	MON	DEC
05	009	SCR		27.09	49	B	08	N	294	12.23	97.35	11.91	7	MON	JUN	S	233	11.06	85.35	9.44	17	WED	SEP
04	009	SCL		7.09	170	A	07	S	456	10.67	61.13	6.52	11	SAT	JUL	N	537	9.69	79.2	7.68	22	SAT	JUL
04	009	SCL		11.45	171	B	07	N	1613	7.59	60.8	4.62	8	WED	OCT	N	1841	8.84	59.64	5.27	15	TUE	JAN
07	010	LA		18.41	456	B	08	W	819	11.39	93.81	10.69	9	FRI	DEC	E	580	9.9	76.42	7.57	15	FRI	JUL
07	010	LA		19.71	783	O	08	W	868	11.22	92.34	10.36	9	THU	OCT	E	569	8.93	76.07	6.79	17	THU	NOV
07	010	LA		24.31	785	A	08	W	1498	6.78	86.74	5.88	9	WED	MAR	E	1523	8.2	72.98	5.98	15	WED	MAR
07	010	LA	R	3.89	402	B	06	W	7499	7.61	52.15	3.97	7	WED	SEP	E	6834	6.82	53.07	3.62	14	WED	MAY
07	010	LA		24.32	721	A	08	E	7451	6.26	53.18	3.33	12	SAT	SEP	E	7695	6.01	57.18	3.43	16	TUE	AUG
07	010	LA		30.3	429	A	08	W	7633	6.41	55.24	3.54	10	SAT	MAR	E	7707	6.31	56.63	3.57	14	WED	MAR

CALTRANS 2008 AADT												
District	Route	Rte Suf	County	PM Pre	Postmile	Description	Back Peak Hour	Back Peak Month	Back AADT	Ahead Peak Hour	Ahead Peak Month	Ahead AADT
11	8		IMP	R	10.010	JCT. RTE. 98	1900	15500	14000	1800	13600	12200
11	8		IMP	R	11.918	OCOTILLO, IMPERIAL HIGHWAY INTERCHANGE	1800	13600	12200	1750	14500	12200
11	8		IMP	R	23.480	DUNAWAY ROAD	1750	14500	12200	1750	13400	12300
11	8		IMP	R	29.933	DREW ROAD	1750	13400	12300	1950	15300	14200
11	8		IMP	R	33.991	FORRESTER ROAD INTERCHANGE	1950	15300	14200	2150	20400	18100
11	8		IMP	R	36.973	IMPERIAL AVENUE	2150	20400	18100	3800	35000	32500
11	8		IMP	R	37.972	JCT. RTE. 86	3800	35000	32500	4150	38000	34500
11	8		IMP	R	38.964	DOGWOOD ROAD INTERCHANGE	4150	38000	34500	2900	32000	31500
11	8		IMP	R	40.944	JCT. RTE. 111	2900	32000	31500	1350	15500	14600

2007

Annual Average Daily Truck Traffic  
on the  
California State Highway System

Compiled by  
Traffic Data Branch  
Division of Traffic Operations

State of California  
Business, Transportation and Housing Agency  
Department of Transportation

Prepared in cooperation with the  
U.S. Department of Transportation  
Federal Highway Administration

SEPTEMBER 2008

RTE	DIST	CNTY	POST MILE	L E G	DESCRIPTION	VEHICLE AADT TOTAL	TRUCK		TRUCK AADT TOTAL	% TRUCK AADT					EAL 2-WAY (1000) EST	YEAR VER/ EST		
							AADT TOTAL	% TOT VEH		By Axle								
										2	3	4	5+					
008	11	IMP	R10.01	A	JCT. RTE. 98	12200	1696	13.9	607	78	39	972	35.8	4.6	2.3	57.3	369	05E
008	11	IMP	R23.48	A	DUNAWAY ROAD	12300	1931	15.7	583	90	39	1219	30.18	4.68	2.03	63.12	455	08V
008	11	IMP	R29.933	B	DREW ROAD	12300	1998	16.24	592	93	37	1277	29.63	4.63	1.85	63.89	475	05E
008	11	IMP	R37.972	B	JCT. RTE. 86	32500	3478	10.7	1120	191	77	2090	32.2	5.5	2.2	60.1	789	05E
008	11	IMP	R37.972	A	JCT. RTE. 86	34500	3509	10.17	1131	192	77	2109	32.24	5.46	2.19	60.11	796	05E
008	11	IMP	R40.944	B	JCT. RTE. 111	31500	2844	9.03	684	178	52	1930	24.04	6.27	1.83	67.85	714	08V
008	11	IMP	R40.944	A	JCT. RTE. 111	14600	3358	23	860	222	87	2189	25.6	6.6	2.6	65.2	819	00E
008	11	IMP	R53.497	B	JCT. RTE. 115 NORTH	11000	3300	30	845	218	86	2152	25.6	6.6	2.6	65.2	805	00E
008	11	IMP	R53.497	A	JCT. RTE. 115 NORTH	11600	3074	26.5	787	203	80	2004	25.6	6.6	2.6	65.2	749	00E
008	11	IMP	R65.752	B	EAST JCT. RTE. 98 WEST	11600	3074	26.5	787	203	80	2004	25.6	6.6	2.6	65.2	749	00E
008	11	IMP	R65.752	A	EAST JCT. RTE. 98 WEST	14000	3360	24	860	222	87	2191	25.6	6.6	2.6	65.2	819	00E
008	11	IMP	R96.546	B	4TH AVENUE	19400	1505	7.76	279	110	78	1038	18.51	7.31	5.21	68.96	389	06V
008	11	IMP	R96.986	B	ARIZONA STATE LINE	16800	3259	19.4	834	215	85	2125	25.6	6.6	2.6	65.2	795	00E

## **Appendix H**

### **Count Data**

# INTERSECTION TURNING MOVEMENT COUNTS

PREPARED BY: PACIFIC TRAFFIC DATA SERVICES

DATE:  
6/3/10  
THURSDAY

LOCATION:  
NORTH & SOUTH:  
EAST & WEST:

EL CENTRO  
DUNAWAY  
EVEN HEWES HWY

PROJECT #:  
LOCATION #:  
CONTROL:

CA10-0611-06  
1  
1-WAY STOP

NOTES:

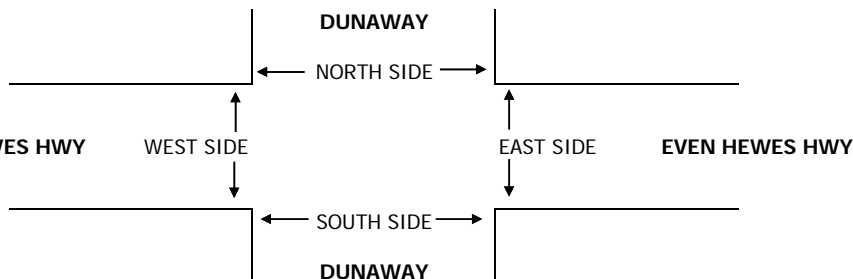
AM  
PM  
MD  
OTHER  
OTHER

W  
E

N  
S

	NORTHBOUND DUNAWAY			SOUTHBOUND DUNAWAY			EASTBOUND EVEN HEWES HWY			WESTBOUND EVEN HEWES HWY			TOTAL
LANES:	NL 0.5	NT X	NR 0.5	SL X	ST X	SR X	EL X	ET 1	ER 0	WL 0	WT 1	WR X	
6:00 AM	0		6					0	0	8	1		15
6:15 AM	1		5					2	1	2	3		14
6:30 AM	0		5					1	0	2	1		9
6:45 AM	3		4					2	1	3	2		15
7:00 AM	5		6					5	2	1	5		24
7:15 AM	8		8					3	0	4	9		32
7:30 AM	4		4					3	0	2	9		22
7:45 AM	8		5					1	0	1	5		20
VOLUMES	29	0	43	0	0	0	0	17	4	23	35	0	151
APPROACH %	40%	0%	60%	0%	0%	0%	0%	81%	19%	40%	60%	0%	
APP/DEPART	72	/	0	0	/	27	21	/	60	58	/	64	0
BEGIN PEAK HR	7:00 AM												
VOLUMES	25	0	23	0	0	0	0	12	2	8	28	0	98
APPROACH %	52%	0%	48%	0%	0%	0%	0%	86%	14%	22%	78%	0%	
PEAK HR FACTOR	0.750			0.000			0.500			0.692			0.766
APP/DEPART	48	/	0	0	/	10	14	/	35	36	/	53	0
2:00 PM	1		1					9	7	6	3		27
2:15 PM	1		1					5	2	5	2		16
2:30 PM	0		5					7	3	8	3		26
2:45 PM	0		1					2	1	5	2		11
3:00 PM	2		2					4	0	4	7		19
3:15 PM	3		4					2	0	5	5		19
3:30 PM	2		7					4	1	5	3		22
3:45 PM	0		2					0	0	4	0		6
VOLUMES	9	0	23	0	0	0	0	33	14	42	25	0	146
APPROACH %	28%	0%	72%	0%	0%	0%	0%	70%	30%	63%	37%	0%	
APP/DEPART	32	/	0	0	/	56	47	/	56	67	/	34	0
BEGIN PEAK HR	2:00 PM												
VOLUMES	2	0	8	0	0	0	0	23	13	24	10	0	80
APPROACH %	20%	0%	80%	0%	0%	0%	0%	64%	36%	71%	29%	0%	
PEAK HR FACTOR	0.500			0.000			0.563			0.773			0.741
APP/DEPART	10	/	0	0	/	37	36	/	31	34	/	12	0

U-TURNS					
NB	SB	EB	WB	TTL	
X	X	X	X		
					0
					0
					0
					0
					0
					0
					0
					0
0	0	0	0		0



AM	6:00 AM	
	6:15 AM	
	6:30 AM	
	6:45 AM	
	7:00 AM	
	7:15 AM	
	7:30 AM	
	7:45 AM	
	TOTAL	
PM	2:00 PM	
	2:15 PM	
	2:30 PM	
	2:45 PM	
	3:00 PM	
	3:15 PM	
	3:30 PM	
	3:45 PM	
	TOTAL	

PEDESTRIAN CROSSINGS				
N SIDE	S SIDE	E SIDE	W SIDE	TOTAL
				0
				0
				0
				0
				0
				0
				0
				0
0	0	0	0	0
				0
				0
				0
				0
				0
				0
				0
0	0	0	0	0

PEDESTRIAN ACTIVATIONS				
N SIDE	S SIDE	E SIDE	W SIDE	TOTAL
				0
				0
				0
				0
				0
				0
				0
				0
0	0	0	0	0
				0
				0
				0
				0
				0
				0
				0
0	0	0	0	0

BICYCLE CROSSINGS				
NS	SS	ES	WS	TOTAL
				0
				0
				0
				0
				0
				0
				0
				0
0	0	0	0	0
				0
				0
				0
				0
				0
				0
				0
0	0	0	0	0

# INTERSECTION TURNING MOVEMENT COUNTS

PREPARED BY: PACIFIC TRAFFIC DATA SERVICES

DATE:  
6/3/10  
THURSDAY

LOCATION:  
NORTH & SOUTH:  
EAST & WEST:

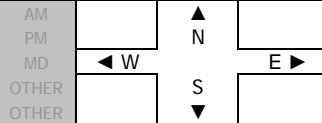
EL CENTRO  
DUNAWAY  
I-8WB RAMPS

PROJECT #:  
LOCATION #:  
CONTROL:

CA10-0611-06  
2  
1-WAY STOP: WB

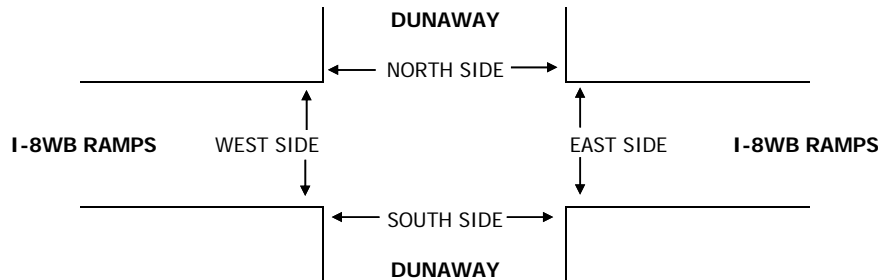
NOTES:

WR IS A YIELD.



	NORTHBOUND DUNAWAY			SOUTHBOUND DUNAWAY			EASTBOUND I-8WB RAMPS			WESTBOUND I-8WB RAMPS			TOTAL
LANES:	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	
	0	1	X	X	1	0	X	X	X	0.5	0.5	1	
6:00 AM	0	2			4	5				0	0	5	16
6:15 AM	0	4			1	4				2	0	1	12
6:30 AM	0	3			0	0				0	0	3	6
6:45 AM	0	3			2	3				0	0	5	13
7:00 AM	0	7			3	1				1	0	6	18
7:15 AM	0	5			0	2				1	0	10	18
7:30 AM	0	2			0	4				0	0	10	16
7:45 AM	0	1			0	1				0	0	10	12
VOLUMES	0	27	0	0	10	20	0	0	0	4	0	50	111
APPROACH %	0%	100%	0%	0%	33%	67%	0%	0%	0%	7%	0%	93%	
APP/DEPART	27	/	77	30	/	14	0	/	0	54	/	20	0
BEGIN PEAK HR	6:45 AM												
VOLUMES	0	17	0	0	5	10	0	0	0	2	0	31	65
APPROACH %	0%	100%	0%	0%	33%	67%	0%	0%	0%	6%	0%	94%	
PEAK HR FACTOR	0.607			0.750			0.000			0.750			0.903
APP/DEPART	17	/	48	15	/	7	0	/	0	33	/	10	0
2:00 PM	0	1			9	4				0	1	2	17
2:15 PM	0	1			3	3				1	1	1	10
2:30 PM	0	3			5	4				0	0	1	13
2:45 PM	0	1			1	9				0	1	0	12
3:00 PM	0	2			0	1				0	0	2	5
3:15 PM	0	3			2	4				0	0	5	14
3:30 PM	0	6			3	3				1	0	0	13
3:45 PM	0	1			1	5				1	0	1	9
VOLUMES	0	18	0	0	24	33	0	0	0	3	3	12	93
APPROACH %	0%	100%	0%	0%	42%	58%	0%	0%	0%	17%	17%	67%	
APP/DEPART	18	/	30	57	/	27	0	/	0	18	/	36	0
BEGIN PEAK HR	2:00 PM												
VOLUMES	0	6	0	0	18	20	0	0	0	1	3	4	52
APPROACH %	0%	100%	0%	0%	47%	53%	0%	0%	0%	13%	38%	50%	
PEAK HR FACTOR	0.500			0.731			0.000			0.667			0.765
APP/DEPART	6	/	10	38	/	19	0	/	0	8	/	23	0

U-TURNS					
NB	SB	EB	WB	TTL	
X	X	X	X		
					0
					0
					0
					0
					0
					0
					0
					0
0	0	0	0	0	0



AM	6:00 AM	
	6:15 AM	
	6:30 AM	
	6:45 AM	
	7:00 AM	
	7:15 AM	
	7:30 AM	
	7:45 AM	
PM	2:00 PM	
	2:15 PM	
	2:30 PM	
	2:45 PM	
	3:00 PM	
	3:15 PM	
	3:30 PM	
	3:45 PM	
TOTAL		

PEDESTRIAN CROSSINGS				
N SIDE	S SIDE	E SIDE	W SIDE	TOTAL
				0
				0
				0
				0
				0
				0
				0
0	0	0	0	0
				0
				0
				0
				0
				0
				0
0	0	0	0	0

PEDESTRIAN ACTIVATIONS				
N SIDE	S SIDE	E SIDE	W SIDE	TOTAL
				0
				0
				0
				0
				0
				0
				0
0	0	0	0	0
				0
				0
				0
				0
				0
				0
0	0	0	0	0

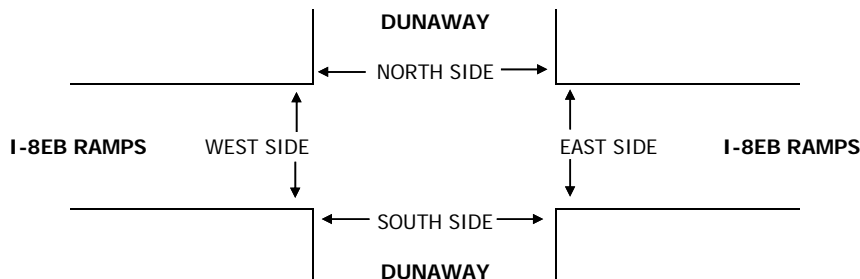
BICYCLE CROSSINGS				
NS	SS	ES	WS	TOTAL
				0
				0
				0
				0
				0
				0
				0
0	0	0	0	0
				0
				0
				0
				0
				0
				0
0	0	0	0	0

PREPARED BY: PACIFIC TRAFFIC DATA SERVICES

1-WAY STOP: EB

ESTROU

U-TURNS					
NB	SB	EB	WB	TTL	
X	X	X	X		0
					0
					0
					0
					0
					0
					0
0	0	0	0	0	
					0
					0
					0
					0
					0
					0
0	0	0	0	0	



BICYCLE CROSSINGS				
NS	SS	ES	WS	TOTAL
				0
				0
				0
				0
				0
				0
				0
0	0	0	0	0
				0
				0
				0
				0
				0
				0
0	0	0	0	0

# LOS Engineering, Inc.

5114 Sea Mist Court, San Diego, CA 92121

Counted By: Emp. #01

Start Date: 03/20/2008

Location: Drew Road & I-8 Westbound Ramps

File Name: 844-01-1

	Drew Road Northbound				Drew Road Southbound				I-8 Westbound On Ramp Eastbound				I-8 Westbound Off Ramp Westbound				Vehicle
Start Time	Left	Thru	Right	Ped	Left	Thru	Right	Ped	Left	Thru	Right	Ped	Left	Thru	Right	Ped	Interval Total
7:00	3	11	0	0	0	19	1	0	0	0	0	0	2	0	22	0	58
7:15	0	8	0	0	0	19	1	0	0	0	0	0	3	0	21	0	52
7:30	1	8	0	0	0	18	4	0	0	0	0	0	3	0	55	0	89
7:45	1	12	0	0	0	25	2	0	0	0	0	0	0	0	42	0	82
Total	5	39	0	0	0	81	8	0	0	0	0	0	8	0	140	0	281
8:00	0	9	0	0	0	28	3	0	0	0	0	0	6	0	17	0	63
8:15	0	2	0	0	0	13	4	0	0	0	0	0	7	0	10	0	36
8:30	1	5	0	0	0	13	1	0	0	0	0	0	5	1	13	0	39
8:45	0	6	0	0	1	11	0	0	0	0	0	0	4	0	11	0	33
Total	1	22	0	0	1	65	8	0	0	0	0	0	22	1	51	0	171
Grand Total	6	61	0	0	1	146	16	0	0	0	0	0	30	1	191	0	452
Approach%	9.0	91.0	-	-	0.6	89.6	9.8	-	-	-	-	-	13.5	0.5	86.0	-	
Total%	1.3	13.5	-	-	0.2	32.3	3.5	-	-	-	-	-	6.6	0.2	42.3	-	

## Peak hour analysis for the period 07:15 to 08:00

Volume	2	37	-	-	-	90	10	-	-	-	-	-	12	-	135	-	286
Approach%	5.1	94.9	-	-	-	90.0	10.0	-	-	-	-	-	8.2	-	91.8	-	
Total%	0.7	12.9	-	-	-	31.5	3.5	-	-	-	-	-	4.2	-	47.2	-	
PHF				0.75				0.81				#####				0.63	

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# LOS Engineering, Inc.

5114 Sea Mist Court, San Diego, CA 92121

Counted By: Emp. #01

Start Date: 03/19/2008

Location: Drew Road & I-8 Westbound Ramps

File Name: 844-01-2

	Drew Road Northbound				Drew Road Southbound				I-8 Westbound On Ramp Eastbound				I-8 Westbound Off Ramp Westbound				Vehicle
Start Time	Left	Thru	Right	Ped	Left	Thru	Right	Ped	Left	Thru	Right	Ped	Left	Thru	Right	Ped	Interval Total
16:00	0	12	0	0	0	47	4	0	0	0	0	0	6	0	14	1	83
16:15	1	8	0	0	0	21	5	0	0	0	0	0	4	0	19	0	58
16:30	0	4	0	0	0	34	5	0	0	0	0	0	4	0	8	0	55
16:45	1	5	0	0	0	27	3	0	0	0	0	0	4	0	11	0	51
Total	2	29	0	0	0	129	17	0	0	0	0	0	18	0	52	1	247
17:00	0	10	0	0	0	16	0	0	0	0	0	0	5	0	16	0	47
17:15	0	7	0	0	0	20	2	0	0	0	0	0	5	0	14	0	48
17:30	0	4	0	0	0	22	1	0	0	0	0	0	12	0	19	0	58
17:45	1	6	0	0	0	19	0	0	0	0	0	0	6	0	16	0	48
Total	1	27	0	0	0	77	3	0	0	0	0	0	28	0	65	0	201
Grand Total	3	56	0	0	0	206	20	0	0	0	0	0	46	0	117	1	448
Approach%	5.1	94.9	-	-	-	91.2	8.8	-	-	-	-	-	28.0	-	71.3	0.6	
Total%	0.7	12.5	-	-	-	46.0	4.5	-	-	-	-	-	10.3	-	26.1	0.2	

## Peak hour analysis for the period 16:00 to 16:45

Volume	2	29	-	-	-	129	17	-	-	-	-	-	18	-	52	1	247
Approach%	6.5	93.5	-	-	-	88.4	11.6	-	-	-	-	-	25.4	-	73.2	1.4	
Total%	0.8	11.7	-	-	-	52.2	6.9	-	-	-	-	-	7.3	-	21.1	0.4	
PHF				0.65				0.72				#####				0.77	

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# LOS Engineering, Inc.

5114 Sea Mist Court, San Diego, CA 92121

Counted By: Emp. #01

Start Date: 03/20/2008

Location: Drew Road & I-8 Eastbound Ramps

File Name: 844-02.1

	Drew Road Northbound				Drew Road Southbound				I-8 Eastbound Off Ramp Eastbound				I-8 Eastbound On Ramp Westbound				Vehicle
Start Time	Left	Thru	Right	Ped	Left	Thru	Right	Ped	Left	Thru	Right	Ped	Left	Thru	Right	Ped	Interval Total
7:00	0	8	4	0	13	7	0	0	6	0	1	0	0	0	0	0	39
7:15	0	6	7	0	13	10	0	0	1	0	2	0	0	0	0	0	39
7:30	0	8	6	0	11	9	0	0	2	0	0	0	0	0	0	0	36
7:45	0	12	3	0	17	7	0	0	1	0	1	0	0	0	0	0	41
Total	0	34	20	0	54	33	0	0	10	0	4	0	0	0	0	0	155
8:00	0	9	5	0	17	17	0	0	1	0	0	0	0	0	0	0	49
8:15	0	3	5	0	7	14	0	0	0	0	1	0	0	0	0	0	30
8:30	0	4	4	0	9	8	0	0	2	0	1	0	0	0	0	0	28
8:45	0	5	3	0	8	7	0	0	0	0	0	0	0	0	0	0	23
Total	0	21	17	0	41	46	0	0	3	0	2	0	0	0	0	0	130
Grand Total	0	55	37	0	95	79	0	0	13	0	6	0	0	0	0	0	285
Approach%	-	59.8	40.2	-	54.6	45.4	-	-	68.4	-	31.6	-	-	-	-	-	
Total%	-	19.3	13.0	-	33.3	27.7	-	-	4.6	-	2.1	-	-	-	-	-	

## Peak hour analysis for the period 07:15 to 08:00

Volume	-	35	21	-	58	43	-	-	5	-	3	-	-	-	-	-	165
Approach%	-	62.5	37.5	-	57.4	42.6	-	-	62.5	-	37.5	-	-	-	-	-	
Total%	-	21.2	12.7	-	35.2	26.1	-	-	3.0	-	1.8	-	-	-	-	-	
PHF				0.93				0.74			0.67				#####		

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# LOS Engineering, Inc.

5114 Sea Mist Court, San Diego, CA 92121

Counted By: Emp. #04

Start Date: 03/19/2008

Location: Drew Road & I-8 Eastbound Ramps

File Name: 844-02-2

	Drew Road Northbound				Drew Road Southbound				I-8 Eastbound Off Ramp Eastbound				I-8 Eastbound On Ramp Westbound				Vehicle
Start Time	Left	Thru	Right	Ped	Left	Thru	Right	Ped	Left	Thru	Right	Ped	Left	Thru	Right	Ped	Interval Total
16:00	0	9	9	0	37	19	0	0	2	1	1	0	0	0	0	1	78
16:15	0	8	5	0	14	12	0	0	2	0	0	0	0	0	0	0	41
16:30	0	3	3	0	27	11	0	0	1	0	0	0	0	0	0	0	45
16:45	0	4	4	0	19	12	0	0	3	0	1	0	0	0	0	0	43
Total	0	24	21	0	97	54	0	0	8	1	2	0	0	0	0	1	207
17:00	0	8	8	0	8	12	0	0	1	0	1	0	0	0	0	0	38
17:15	0	5	2	0	17	8	0	0	1	0	1	0	0	0	0	0	34
17:30	0	2	3	0	18	12	0	0	2	0	0	0	0	0	0	0	37
17:45	0	3	4	0	15	10	0	0	4	0	0	0	0	0	0	0	36
Total	0	18	17	0	58	42	0	0	8	0	2	0	0	0	0	0	145
Grand Total	0	42	38	0	155	96	0	0	16	1	4	0	0	0	0	1	352
Approach%	-	52.5	47.5	-	61.8	38.2	-	-	76.2	4.8	19.0	-	-	-	-	100.0	
Total%	-	11.9	10.8	-	44.0	27.3	-	-	4.5	0.3	1.1	-	-	-	-	0.3	

## Peak hour analysis for the period 16:00 to 16:45

Volume	-	24	21	-	97	54	-	-	8	1	2	-	-	-	-	1	207
Approach%	-	53.3	46.7	-	64.2	35.8	-	-	72.7	9.1	18.2	-	-	-	-	100.0	
Total%	-	11.6	10.1	-	46.9	26.1	-	-	3.9	0.5	1.0	-	-	-	-	0.5	
PHF				0.63				0.67				0.69				0.25	

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# INTERSECTION TURNING MOVEMENT COUNTS

PREPARED BY: PACIFIC TRAFFIC DATA SERVICES

DATE:  
6/3/10  
THURSDAY

LOCATION:  
NORTH & SOUTH:  
EAST & WEST:

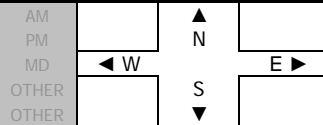
EL CENTRO  
FORRESTER  
I-8WB RAMPS

PROJECT #:  
LOCATION #:  
CONTROL:

CA10-0611-06  
4  
1-WAY STOP: WB

NOTES:

WR IS A YIELD.

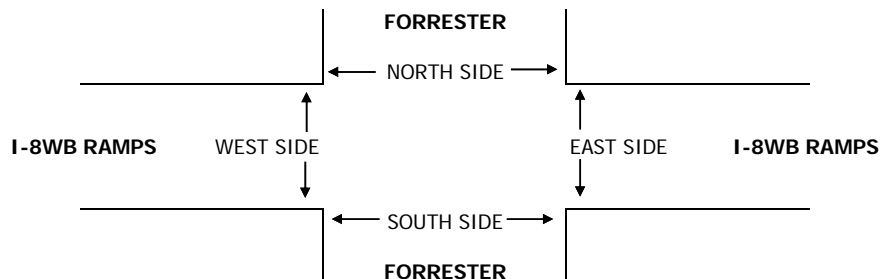


	NORTHBOUND FORRESTER			SOUTHBOUND FORRESTER			EASTBOUND I-8WB RAMPS			WESTBOUND I-8WB RAMPS			
LANES:	NL 0	NT 1	NR X	SL X	ST 1	SR 0	EL X	ET X	ER X	WL 1	WT 0	WR 1	TOTAL

U-TURNS				
NB X	SB X	EB X	WB X	TTL

AM	6:00 AM	2	11			25	9				2	0	50	99
	6:15 AM	1	18			31	5				4	1	58	118
	6:30 AM	2	17			27	9				4	0	68	127
	6:45 AM	4	12			30	15				4	1	42	108
	7:00 AM	6	15			31	13				3	0	42	110
	7:15 AM	5	10			39	10				4	0	59	127
	7:30 AM	3	12			50	12				4	1	62	144
	7:45 AM	4	16			50	11				7	0	52	140
	VOLUMES	27	111	0	0	283	84	0	0	0	32	3	433	973
	APPROACH %	20%	80%	0%	0%	77%	23%	0%	0%	0%	7%	1%	93%	
PM	APP/DEPART	138	/	544	367	/	315	0	/	0	468	/	114	0
	BEGIN PEAK HR	7:00 AM												
	VOLUMES	18	53	0	0	170	46	0	0	0	18	1	215	521
	APPROACH %	25%	75%	0%	0%	79%	21%	0%	0%	0%	8%	0%	92%	
	PEAK HR FACTOR	0.845												
	APP/DEPART	71	/	268	216	/	188	0	/	0	234	/	65	0
	2:00 PM	0	11			59	14				4	0	42	130
	2:15 PM	3	15			61	17				3	1	39	139
	2:30 PM	4	16			48	15				5	0	44	132
	2:45 PM	6	14			72	13				3	2	42	152
PM	3:00 PM	2	20			68	11				7	0	36	144
	3:15 PM	1	23			46	13				4	1	27	115
	3:30 PM	1	20			70	10				2	0	25	128
	3:45 PM	0	28			84	18				1	0	26	157
	VOLUMES	17	147	0	0	508	111	0	0	0	29	4	281	1,097
	APPROACH %	10%	90%	0%	0%	82%	18%	0%	0%	0%	9%	1%	89%	
	APP/DEPART	164	/	428	619	/	537	0	/	0	314	/	132	0
	BEGIN PEAK HR	2:15 PM												
	VOLUMES	15	65	0	0	249	56	0	0	0	18	3	161	567
	APPROACH %	19%	81%	0%	0%	82%	18%	0%	0%	0%	10%	2%	88%	
	PEAK HR FACTOR	0.909												
PM	APP/DEPART	80	/	226	305	/	267	0	/	0	182	/	74	0

				0
				0
				0
				0
				0
				0
				0
				0
				0
0	0	0	0	0



AM	6:00 AM	
	6:15 AM	
	6:30 AM	
	6:45 AM	
	7:00 AM	
	7:15 AM	
	7:30 AM	
	7:45 AM	
	TOTAL	
PM	2:00 PM	
	2:15 PM	
	2:30 PM	
	2:45 PM	
	3:00 PM	
	3:15 PM	
	3:30 PM	
	3:45 PM	
	TOTAL	

PEDESTRIAN CROSSINGS				
N SIDE	S SIDE	E SIDE	W SIDE	TOTAL
				0
				0
				0
				0
				0
				0
				0
0	0	0	0	0
				0
				0
				0
				0
				0
				0
0	0	0	0	0

PEDESTRIAN ACTIVATIONS				
N SIDE	S SIDE	E SIDE	W SIDE	TOTAL
				0
				0
				0
				0
				0
				0
				0
0	0	0	0	0
				0
				0
				0
				0
				0
				0
0	0	0	0	0

BICYCLE CROSSINGS				
NS	SS	ES	WS	TOTAL
				0
				0
				0
				0
				0
				0
				0
0	0	0	0	0
				0
				0
				0
				0
				0
				0
0	0	0	0	0

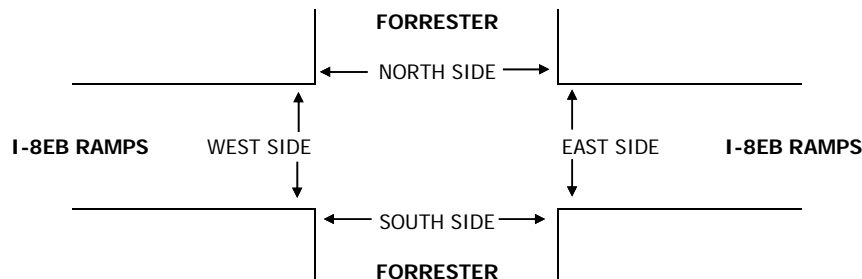
PREPARED BY: PACIFIC TRAFFIC DATA SERVICES

1-WAY STOP: EB

▲  
N  
S  
▼

U-TURNS				
NB X	SB X	EB X	WB X	TTL

				0
				0
				0
				0
				0
				0
				0
0	0	0	0	0
				0
				0
				0
				0
				0
				0
				0
0	0	0	0	0



BICYCLE CROSSINGS				
NS	SS	ES	WS	TOTAL
				0
				0
				0
				0
				0
				0
				0
0	0	0	0	0
				0
				0
				0
				0
				0
				0
0	0	0	0	0

THURSDAY - JUNE 3, 2010

CITY: EL CENTRO

PROJECT: CA10-0611-06-001

## DUNAWAY BTN 1-8WB RAMPS &amp; EVAN HEWES HWY

AM Period	NB	SB	EB	WB	PM Period	NB	SB	EB	WB
00:00	1	0			12:00	2	5		
00:15	1	2			12:15	2	10		
00:30	0	0			12:30	4	2		
00:45	1	3	0	2	12:45	1	9	3	20
01:00	0	0			13:00	7	4		
01:15	0	0			13:15	5	6		
01:30	1	0			13:30	8	4		
01:45	1	2	0	0	13:45	5	25	7	21
02:00	1	5			14:00	4	13		
02:15	1	1			14:15	0	7		
02:30	1	0			14:30	6	10		
02:45	0	3	3	9	14:45	1	11	8	38
03:00	1	0			15:00	4	4		
03:15	2	0			15:15	7	4		
03:30	2	1			15:30	9	7		
03:45	0	5	0	1	15:45	3	23	5	20
04:00	1	1			16:00	4	13		
04:15	5	2			16:15	5	6		
04:30	11	3			16:30	5	13		
04:45	3	20	1	7	16:45	4	18	13	45
05:00	3	3			17:00	6	25		
05:15	5	3			17:15	4	1		
05:30	12	2			17:30	2	2		
05:45	13	33	4	12	17:45	3	15	4	32
06:00	6	8			18:00	6	5		
06:15	7	4			18:15	3	1		
06:30	4	2			18:30	7	4		
06:45	7	24	4	18	18:45	1	17	1	11
07:00	11	3			19:00	1	1		
07:15	16	4			19:15	2	1		
07:30	8	3			19:30	6	1		
07:45	14	49	1	11	19:45	2	11	2	5
08:00	7	3			20:00	3	0		
08:15	4	9			20:15	1	1		
08:30	5	4			20:30	0	1		
08:45	6	22	4	20	20:45	5	9	0	2
09:00	5	4			21:00	6	0		
09:15	6	5			21:15	6	7		
09:30	4	5			21:30	3	3		
09:45	6	21	3	17	21:45	1	16	13	23
10:00	3	11			22:00	1	1		
10:15	3	4			22:15	2	2		
10:30	3	4			22:30	4	1		
10:45	4	13	8	27	22:45	4	11	0	4
11:00	0	5			23:00	3	2		
11:15	1	11			23:15	3	0		
11:30	4	4			23:30	1	1		
11:45	5	10	1	21	23:45	1	8	4	7
Total Vol.	205	145							
				350		173	228		401

Daily Totals				
NB	SB	EB	WB	Combined
378	373			751

AM				PM		
Split %	58.6%	41.4%	46.6%	43.1%	56.9%	53.4%
Peak Hour	07:00	10:30	07:00	13:00	16:15	16:15
Volume	49	28	60	25	57	77
P.H.F.	0.77	0.64	0.75	0.88	0.57	0.62

THURSDAY - JUNE 3, 2010

CITY: EL CENTRO

PROJECT: CA10-0611-06-003

EVAN HEWES HWY BTN DUNAWAY &amp; HUFF

AM Period	NB	SB	EB	WB	PM Period	NB	SB	EB	WB				
00:00			3	0	12:00			3	6				
00:15			4	0	12:15			4	8				
00:30			1	0	12:30			8	6				
00:45			0	8	0	8	12:45	2	17	6	26	43	
01:00			1	1	13:00			9	6				
01:15			0	0	13:15			7	11				
01:30			2	0	13:30			13	9				
01:45			1	4	1	2	6	13:45	4	33	8	34	67
02:00			3	0	14:00			10	9				
02:15			0	0	14:15			6	7				
02:30			0	1	14:30			12	11				
02:45			0	3	2	3	6	14:45	4	32	8	35	67
03:00			2	2	15:00			6	10				
03:15			0	0	15:15			7	12				
03:30			2	1	15:30			11	8				
03:45			0	4	0	3	7	15:45	3	27	5	35	62
04:00			0	0	16:00			3	6				
04:15			0	2	16:15			10	5				
04:30			4	2	16:30			6	10				
04:45			2	6	7	11	17	16:45	10	29	9	30	59
05:00			3	2	17:00			15	12				
05:15			3	1	17:15			6	2				
05:30			5	9	17:30			7	2				
05:45			11	22	7	19	41	17:45	5	33	3	19	52
06:00			10	9	18:00			6	5				
06:15			7	5	18:15			6	3				
06:30			5	4	18:30			4	6				
06:45			5	27	5	23	50	18:45	7	23	4	18	41
07:00			7	7	19:00			3	2				
07:15			8	12	19:15			4	3				
07:30			5	11	19:30			5	1				
07:45			5	25	7	37	62	19:45	7	19	0	6	25
08:00			5	11	20:00			3	1				
08:15			5	5	20:15			2	1				
08:30			7	8	20:30			2	1				
08:45			2	19	5	29	48	20:45	1	8	1	4	12
09:00			7	6	21:00			5	2				
09:15			4	3	21:15			6	5				
09:30			3	5	21:30			4	0				
09:45			5	19	5	19	38	21:45	2	17	11	18	35
10:00			9	5	22:00			2	1				
10:15			5	6	22:15			1	4				
10:30			3	6	22:30			1	0				
10:45			5	22	11	28	50	22:45	4	8	0	5	13
11:00			4	5	23:00			0	7				
11:15			6	10	23:15			1	2				
11:30			4	5	23:30			2	0				
11:45			4	18	5	25	43	23:45	1	4	0	9	13
Total Vol.			177	199	376				250	239	489		

		Daily Totals		
NB	SB	EB	WB	Combined
		427	438	865

AM				PM		
Split %	47.1%	52.9%	43.5%	51.1%	48.9%	56.5%
<b>Peak Hour</b>	05:30	07:15	<b>07:15</b>	16:15	14:30	<b>16:15</b>
<b>Volume</b>	33	41	<b>64</b>	41	41	<b>77</b>
<b>P.H.F.</b>	0.75	0.85	<b>0.80</b>	0.68	0.85	<b>0.71</b>

PACIFIC TRAFFIC &amp; TRANSIT DATA SERVICES










CALTRANS 2008 AADT												
District	Route	Rte Suf	County	PM Pre	Postmile	Description	Back Peak Hour	Back Peak Month	Back AADT	Ahead Peak Hour	Ahead Peak Month	Ahead AADT
11	8		IMP	R	10.010	JCT. RTE. 98	1900	15500	14000	1800	13600	12200
11	8		IMP	R	11.918	OCOTILLO, IMPERIAL HIGHWAY INTERCHANGE	1800	13600	12200	1750	14500	12200
11	8		IMP	R	23.480	DUNAWAY ROAD	1750	14500	12200	1750	13400	12300
11	8		IMP	R	29.933	DREW ROAD	1750	13400	12300	1950	15300	14200
11	8		IMP	R	33.991	FORRESTER ROAD INTERCHANGE	1950	15300	14200	2150	20400	18100
11	8		IMP	R	36.973	IMPERIAL AVENUE	2150	20400	18100	3800	35000	32500
11	8		IMP	R	37.972	JCT. RTE. 86	3800	35000	32500	4150	38000	34500
11	8		IMP	R	38.964	DOGWOOD ROAD INTERCHANGE	4150	38000	34500	2900	32000	31500
11	8		IMP	R	40.944	JCT. RTE. 111	2900	32000	31500	1350	15500	14600

## **Appendix I**

### **Existing Intersection LOS Calculations**

AM Existing  
1: Evan Hewes Hwy & Dunaway Rd

















HCM Unsignalized Intersection Capacity Analysis

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	12	2	8	28	25	23
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	13	2	9	30	27	25
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			15		62	14
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			15		62	14
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			99		97	98
cM capacity (veh/h)			1603		939	1066
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	15	39	52			
Volume Left	0	9	27			
Volume Right	2	0	25			
cSH	1700	1603	996			
Volume to Capacity	0.01	0.01	0.05			
Queue Length 95th (ft)	0	0	4			
Control Delay (s)	0.0	1.6	8.8			
Lane LOS		A	A			
Approach Delay (s)	0.0	1.6	8.8			
Approach LOS			A			
Intersection Summary						
Average Delay			4.9			
Intersection Capacity Utilization			18.4%	ICU Level of Service		A
Analysis Period (min)			15			

# AM Existing

## 3: I-8 WB Ramp & Dunaway Rd

















## HCM Unsignalized Intersection Capacity Analysis

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	0	0	2	0	31	0	17	0	0	5	10
Sign Control	Stop			Stop			Free			Free		
Grade	0%			0%			0%			0%		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	2	0	34	0	18	0	0	5	11
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)	2											
Median type							None			None		
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	46	29	11	29	35	18	16				18	
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	46	29	11	29	35	18	16				18	
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1				4.1	
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2				2.2	
p0 queue free %	100	100	100	100	100	97	100				100	
cM capacity (veh/h)	925	864	1070	980	858	1060	1601				1598	
Direction, Lane #	WB 1	NB 1	SB 1									
Volume Total	36	18	16									
Volume Left	2	0	0									
Volume Right	34	0	11									
cSH	1128	1601	1700									
Volume to Capacity	0.03	0.00	0.01									
Queue Length 95th (ft)	2	0	0									
Control Delay (s)	8.5	0.0	0.0									
Lane LOS	A											
Approach Delay (s)	8.5	0.0	0.0									
Approach LOS	A											
Intersection Summary												
Average Delay	4.3											
Intersection Capacity Utilization	13.3%			ICU Level of Service			A					
Analysis Period (min)	15											

# AM Existing

















## 4: I-8 EB Ramp & Dunaway Rd

## HCM Unsignalized Intersection Capacity Analysis

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	13	1	0	0	0	0	0	0	1	8	3	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	14	1	0	0	0	0	0	0	1	9	3	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)			2									
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	21	22	3	22	21	1	3			1		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	21	22	3	22	21	1	3			1		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	99	100	100	100	100	100	100			99		
cM capacity (veh/h)	987	867	1081	986	868	1084	1619			1622		
Direction, Lane #	EB 1	NB 1	SB 1									
Volume Total	15	1	12									
Volume Left	14	0	9									
Volume Right	0	1	0									
cSH	932	1700	1622									
Volume to Capacity	0.02	0.00	0.01									
Queue Length 95th (ft)	1	0	0									
Control Delay (s)	8.9	0.0	5.3									
Lane LOS	A		A									
Approach Delay (s)	8.9	0.0	5.3									
Approach LOS	A											
Intersection Summary												
Average Delay			7.0									
Intersection Capacity Utilization			17.2%			ICU Level of Service				A		
Analysis Period (min)			15									

















AM Existing  
5: I-8 WB Ramp & Drew Rd

HCM Unsignalized Intersection Capacity Analysis

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	0	0	13	0	143	2	39	0	0	95	11
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	14	0	155	2	42	0	0	103	12
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)						2						
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	234	156	109	156	162	42	115			42		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	234	156	109	156	162	42	115			42		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	98	100	85	100			100		
cM capacity (veh/h)	611	735	944	810	729	1028	1474			1567		
Direction, Lane #	WB 1	NB 1	SB 1									
Volume Total	170	45	115									
Volume Left	14	2	0									
Volume Right	155	0	12									
cSH	1122	1474	1700									
Volume to Capacity	0.15	0.00	0.07									
Queue Length 95th (ft)	13	0	0									
Control Delay (s)	9.2	0.4	0.0									
Lane LOS	A	A										
Approach Delay (s)	9.2	0.4	0.0									
Approach LOS	A											
Intersection Summary												
Average Delay			4.8									
Intersection Capacity Utilization			18.9%	ICU Level of Service						A		
Analysis Period (min)			15									

















AM Existing  
6: I-8 EB Ramp & Drew Rd

HCM Unsignalized Intersection Capacity Analysis

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	5	0	3	0	0	0	0	37	22	61	45	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	5	0	3	0	0	0	0	40	24	66	49	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)			2									
Median type								None			None	
Median storage veh												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	234	246	49	235	234	52	49			64		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	234	246	49	235	234	52	49			64		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	99	100	100	100	100	100	100			96		
cM capacity (veh/h)	697	628	1020	693	638	1015	1558			1538		
Direction, Lane #	EB 1	NB 1	SB 1									
Volume Total	9	64	115									
Volume Left	5	0	66									
Volume Right	3	24	0									
cSH	1116	1700	1538									
Volume to Capacity	0.01	0.04	0.04									
Queue Length 95th (ft)	1	0	3									
Control Delay (s)	9.6	0.0	4.4									
Lane LOS	A		A									
Approach Delay (s)	9.6	0.0	4.4									
Approach LOS	A											
Intersection Summary												
Average Delay			3.2									
Intersection Capacity Utilization			22.4%			ICU Level of Service				A		
Analysis Period (min)			15									

AM Existing  
7: I-8 WB Ramp & Forrester Road

















HCM Unsignalized Intersection Capacity Analysis

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	0	0	18	1	215	18	53	0	0	170	46
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	20	1	234	20	58	0	0	185	50
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)						2						
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	424	307	210	307	332	58	235			58		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	424	307	210	307	332	58	235			58		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	97	100	77	99			100		
cM capacity (veh/h)	410	598	830	639	579	1009	1333			1547		
Direction, Lane #	WB 1	NB 1	SB 1									
Volume Total	254	77	235									
Volume Left	20	20	0									
Volume Right	234	0	50									
cSH	1098	1333	1700									
Volume to Capacity	0.23	0.01	0.14									
Queue Length 95th (ft)	22	1	0									
Control Delay (s)	9.7	2.1	0.0									
Lane LOS	A	A										
Approach Delay (s)	9.7	2.1	0.0									
Approach LOS	A											
Intersection Summary												
Average Delay			4.7									
Intersection Capacity Utilization			28.5%	ICU Level of Service						A		
Analysis Period (min)			15									

# AM Existing










## 8: I-8 EB Ramp & Forrester Road

## HCM Unsignalized Intersection Capacity Analysis

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	35	0	3	0	0	0	0	36	19	146	42	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	38	0	3	0	0	0	0	39	21	159	46	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)			2									
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	412	423	46	414	412	49	46			60		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	412	423	46	414	412	49	46			60		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	92	100	100	100	100	100	100			90		
cM capacity (veh/h)	507	469	1024	504	475	1019	1562			1544		
Direction, Lane #	EB 1	NB 1	SB 1									
Volume Total	41	60	204									
Volume Left	38	0	159									
Volume Right	3	21	0									
cSH	550	1700	1544									
Volume to Capacity	0.08	0.04	0.10									
Queue Length 95th (ft)	6	0	9									
Control Delay (s)	12.4	0.0	6.1									
Lane LOS	B		A									
Approach Delay (s)	12.4	0.0	6.1									
Approach LOS	B											
Intersection Summary												
Average Delay			5.7									
Intersection Capacity Utilization			27.0%			ICU Level of Service				A		
Analysis Period (min)			15									

PM Existing  
1: Evan Hewes Hwy & Dunaway Rd

















HCM Unsignalized Intersection Capacity Analysis

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	23	13	24	10	2	8
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	25	14	26	11	2	9
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			39		95	32
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			39		95	32
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			98		100	99
cM capacity (veh/h)			1571		889	1042
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	39	37	11			
Volume Left	0	26	2			
Volume Right	14	0	9			
cSH	1700	1571	1007			
Volume to Capacity	0.02	0.02	0.01			
Queue Length 95th (ft)	0	1	1			
Control Delay (s)	0.0	5.2	8.6			
Lane LOS		A	A			
Approach Delay (s)	0.0	5.2	8.6			
Approach LOS			A			
Intersection Summary						
Average Delay			3.3			
Intersection Capacity Utilization			18.5%	ICU Level of Service		A
Analysis Period (min)			15			

# PM Existing

## 3: I-8 WB Ramp & Dunaway Rd

















## HCM Unsignalized Intersection Capacity Analysis

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	0	0	1	3	4	0	6	0	0	18	20
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	1	3	4	0	7	0	0	20	22
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)						2						
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	41	37	30	37	48	7	41			7		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	41	37	30	37	48	7	41			7		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	100	100	100	100			100		
cM capacity (veh/h)	956	855	1044	968	844	1076	1568			1614		
Direction, Lane #	WB 1	NB 1	SB 1									
Volume Total	9	7	41									
Volume Left	1	0	0									
Volume Right	4	0	22									
cSH	1750	1568	1700									
Volume to Capacity	0.00	0.00	0.02									
Queue Length 95th (ft)	0	0	0									
Control Delay (s)	8.7	0.0	0.0									
Lane LOS	A											
Approach Delay (s)	8.7	0.0	0.0									
Approach LOS	A											
Intersection Summary												
Average Delay			1.3									
Intersection Capacity Utilization			13.3%	ICU Level of Service					A			
Analysis Period (min)			15									

# PM Existing

















## 4: I-8 EB Ramp & Dunaway Rd

## HCM Unsignalized Intersection Capacity Analysis

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	6	0	3	0	0	0	0	0	6	19	1	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	7	0	3	0	0	0	0	0	7	21	1	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)			2									
Median type								None			None	
Median storage veh												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	46	49	1	47	46	3	1			7		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	46	49	1	47	46	3	1			7		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	99	100	100	100	100	100	100			99		
cM capacity (veh/h)	947	832	1083	941	835	1081	1622			1614		
Direction, Lane #	EB 1	NB 1	SB 1									
Volume Total	10	7	22									
Volume Left	7	0	21									
Volume Right	3	7	0									
cSH	1420	1700	1614									
Volume to Capacity	0.01	0.00	0.01									
Queue Length 95th (ft)	1	0	1									
Control Delay (s)	8.7	0.0	6.9									
Lane LOS	A		A									
Approach Delay (s)	8.7	0.0	6.9									
Approach LOS	A											
Intersection Summary												
Average Delay			6.2									
Intersection Capacity Utilization			17.8%			ICU Level of Service				A		
Analysis Period (min)			15									

















PM Existing  
5: I-8 WB Ramp & Drew Rd

HCM Unsignalized Intersection Capacity Analysis

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	0	0	19	0	55	2	31	0	0	136	18
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	21	0	60	2	34	0	0	148	20
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)						2						
Median type								None			None	
Median storage veh												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	226	196	158	196	205	34	167			34		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	226	196	158	196	205	34	167			34		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	97	100	94	100			100		
cM capacity (veh/h)	687	699	888	763	690	1040	1410			1578		
Direction, Lane #	WB 1	NB 1	SB 1									
Volume Total	80	36	167									
Volume Left	21	2	0									
Volume Right	60	0	20									
cSH	1399	1410	1700									
Volume to Capacity	0.06	0.00	0.10									
Queue Length 95th (ft)	5	0	0									
Control Delay (s)	9.0	0.5	0.0									
Lane LOS	A	A										
Approach Delay (s)	9.0	0.5	0.0									
Approach LOS	A											
Intersection Summary												
Average Delay			2.6									
Intersection Capacity Utilization			18.2%			ICU Level of Service				A		
Analysis Period (min)			15									

PM Existing  
6: I-8 EB Ramp & Drew Rd

















HCM Unsignalized Intersection Capacity Analysis

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	8	1	2	0	0	0	0	25	22	103	57	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	9	1	2	0	0	0	0	27	24	112	62	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)			2									
Median type								None			None	
Median storage veh												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	325	337	62	327	325	39	62			51		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	325	337	62	327	325	39	62			51		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	99	100	100	100	100	100	100			93		
cM capacity (veh/h)	593	542	1003	590	550	1032	1541			1555		
Direction, Lane #	EB 1	NB 1	SB 1									
Volume Total	12	51	174									
Volume Left	9	0	112									
Volume Right	2	24	0									
cSH	718	1700	1555									
Volume to Capacity	0.02	0.03	0.07									
Queue Length 95th (ft)	1	0	6									
Control Delay (s)	10.8	0.0	5.0									
Lane LOS	B		A									
Approach Delay (s)	10.8	0.0	5.0									
Approach LOS	B											
Intersection Summary												
Average Delay		4.2										
Intersection Capacity Utilization		25.4%		ICU Level of Service					A			
Analysis Period (min)		15										

# PM Existing

















## 7: I-8 WB Ramp & Forrester Road

## HCM Unsignalized Intersection Capacity Analysis

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	0	0	18	3	161	15	65	0	0	249	56
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	20	3	175	16	71	0	0	271	61
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)						2						
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	493	404	301	404	435	71	332			71		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	493	404	301	404	435	71	332			71		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	96	99	82	99			100		
cM capacity (veh/h)	394	528	739	551	508	992	1228			1530		
Direction, Lane #	WB 1	NB 1	SB 1									
Volume Total	198	87	332									
Volume Left	20	16	0									
Volume Right	175	0	61									
cSH	1121	1228	1700									
Volume to Capacity	0.18	0.01	0.20									
Queue Length 95th (ft)	16	1	0									
Control Delay (s)	9.7	1.6	0.0									
Lane LOS	A	A										
Approach Delay (s)	9.7	1.6	0.0									
Approach LOS	A											
Intersection Summary												
Average Delay			3.3									
Intersection Capacity Utilization			26.5%	ICU Level of Service						A		
Analysis Period (min)			15									

PM Existing  
8: I-8 EB Ramp & Forrester Road

HCM Unsignalized Intersection Capacity Analysis

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	54	0	1	0	0	0	0	30	18	231	51	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	59	0	1	0	0	0	0	33	20	251	55	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)			2									
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	600	610	55	601	600	42	55			52		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	600	610	55	601	600	42	55			52		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	84	100	100	100	100	100	100			84		
cM capacity (veh/h)	362	343	1011	361	348	1028	1549			1554		
Direction, Lane #	EB 1	NB 1	SB 1									
Volume Total	60	52	307									
Volume Left	59	0	251									
Volume Right	1	20	0									
cSH	368	1700	1554									
Volume to Capacity	0.16	0.03	0.16									
Queue Length 95th (ft)	14	0	14									
Control Delay (s)	16.7	0.0	6.6									
Lane LOS	C		A									
Approach Delay (s)	16.7	0.0	6.6									
Approach LOS	C											
Intersection Summary												
Average Delay		7.2										
Intersection Capacity Utilization		32.1%		ICU Level of Service					A			
Analysis Period (min)		15										

## **Appendix J**

### **Growth Factor Support Data**

**LAND USE ELEMENT**  
**of the Imperial County**  
**GENERAL PLAN**

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**Approved By:**

Board of Supervisors

October 17, 2006

## II. EXISTING CONDITIONS AND TRENDS

### A. Preface

Knowledge, experience and reasoned expectations of future conditions determines the scope of the issues that the Land Use Element must address. This chapter includes a generalized description of existing physical, cultural, and land use features within the County, from both a historic and expected future perspective.

### B. Land Use/Population

Imperial County is, and will continue for the foreseeable future to be, a predominantly agricultural area, **although in 2003 a significant increase in urbanization began to show.** Presently, approximately one-fifth (534,328) of the nearly 3 million acres of the County is irrigated for agricultural purposes. In addition, approximately 50 percent of County lands are largely undeveloped and under federal ownership. The developed area where the County's incorporated cities, 'nincorporated communities, and supporting facilities are situated comprise less than one percent of the land (see Table 1).

Imperial County Planning & Development Services Department bases its population estimates on building permits and housing unit change. From this annual compilation, the Population Research Unit of the California Department of Finance (DOF) estimates the annual change in population. According to the Department of Finance's January 1, 2006, estimates, the population for the unincorporated area is 36,166 with the total population for Imperial County being 166,585. This compares to the 1990 census results of 27,339 for the unincorporated area with the total population for the County being 109,303 and the 2000 census results of 32,772 for the unincorporated area and 147,361 for the entire County (see Table 2). According to DOF 2006 figures, the average household size county-wide is approximately 3.32 persons per household, with the average in cities being 3.42 persons per household and the average in the unincorporated area being 2.96 persons per household.

Population in the unincorporated areas of the County tends to concentrate in agricultural areas and in recreation/retirement communities. Agricultural related communities include the townsites of Heber, Niland and Seeley in the Imperial Valley. Along the Colorado River, in the eastern portion of the County, small population clusters exist within the townsites of Palo Verde and Winterhaven. Recreation/retirement communities include Ocotillo/Nomirage located in the southwest portion of the County, and Hot Mineral Spa and Bombay Beach, on the northeastern shore of the Salton Sea. The West Shores communities of Salton City, Salton Sea Beach, and Desert Shores are also largely retirement and recreation communities, though increasingly their populations are becoming more diversified. These communities experience a noticeable increase in population during the winter months when visitors converge to the area to avoid cold/wet winters in other parts of the country.

E-2. California County Population Estimates and Components of Change  
Revised July 1, 2006 and Provisional July 1, 2007  
Table 1.

County	Total Population		Change 2006-2007		Components of Change			Net		
	Revised July 1, 2006	Provisional July 1, 2007	Number	Percent	Births	Deaths	Natural Increase	Net Migration	Net Immigration	Net Domestic Migration
Alameda	1,513,859	1,530,620	16,761	1.11	20,906	9,384	11,522	5,239	10,033	-4,794
Alpine	1,254	1,261	7	0.56	16	9	7	0	2	-2
Amador	38,083	38,320	237	0.62	291	418	-127	364	19	345
Butte	217,548	219,101	1,553	0.71	2,584	2,148	436	1,117	312	805
Calaveras	45,663	45,950	287	0.63	390	429	-39	326	32	294
Colusa	21,551	21,945	394	1.83	400	142	258	136	108	28
Contra Costa	1,031,012	1,044,201	13,189	1.28	13,584	6,836	6,748	6,441	4,168	2,273
Del Norte	29,009	29,207	198	0.68	374	290	84	114	25	89
El Dorado	176,969	178,689	1,720	0.97	1,981	1,250	731	989	290	699
Fresno	906,365	923,052	16,687	1.84	17,110	5,951	11,159	5,528	4,365	1,163
Glenn	28,628	29,018	390	1.36	455	249	206	184	99	85
Humboldt	131,876	132,364	488	0.37	1,605	1,255	350	138	77	61
Imperial	168,979	174,322	5,343	3.16	3,280	914	2,366	2,977	2,373	604
Inyo	18,221	18,253	32	0.18	242	239	3	29	28	1
Kern	790,246	809,903	19,657	2.49	15,446	5,406	10,040	9,617	3,114	6,503
Kings	149,883	153,268	3,385	2.26	2,742	841	1,901	1,484	564	920
Lake	63,618	63,821	203	0.32	737	850	-113	316	155	161
Lassen	35,521	36,223	702	1.98	268	209	59	643	19	624
Los Angeles	10,247,672	10,294,280	46,608	0.45	152,479	60,800	91,679	-45,071	69,567	-114,638
Madera	146,064	149,916	3,852	2.64	2,565	921	1,644	2,208	505	1,703
Marin	254,000	256,310	2,310	0.91	2,625	1,787	838	1,472	534	938
Mariposa	18,187	18,356	169	0.93	148	176	-28	197	13	184
Mendocino	89,264	89,669	405	0.45	1,137	857	280	125	238	-113
Merced	248,258	252,544	4,286	1.73	4,867	1,435	3,432	854	1,271	-417
Modoc	9,690	9,747	57	0.59	77	114	-37	94	3	91
Mono	14,019	14,055	36	0.26	167	47	120	-84	43	-127
Monterey	421,463	425,356	3,893	0.92	7,371	2,431	4,940	-1,047	2,490	-3,537
Napa	134,186	135,554	1,368	1.02	1,760	1,266	494	874	615	259
Nevada	99,248	99,587	339	0.34	773	982	-209	548	95	453
Orange	3,075,341	3,098,183	22,842	0.74	44,582	17,389	27,193	-4,351	17,584	-21,935
Placer	322,953	329,818	6,865	2.13	3,897	2,257	1,640	5,225	699	4,526
Plumas	21,013	20,891	-122	-0.58	174	226	-52	-70	29	-99
Riverside	2,004,174	2,070,315	66,141	3.30	35,144	13,539	21,605	44,536	7,898	36,638
Sacramento	1,396,496	1,415,117	18,621	1.33	21,703	9,716	11,987	6,634	5,424	1,210
San Benito	57,128	57,493	365	0.64	886	275	611	-246	245	-491
San Bernardino	2,011,404	2,039,467	28,063	1.40	35,351	12,227	23,124	4,939	6,907	-1,968
San Diego	3,077,877	3,120,088	42,211	1.37	46,460	20,298	26,162	16,049	13,067	2,982
San Francisco	806,210	817,537	11,327	1.40	8,683	6,105	2,578	8,749	9,192	-443
San Joaquin	671,115	680,183	9,068	1.35	11,880	4,392	7,488	1,580	3,572	-1,992
San Luis Obispo	264,972	267,154	2,182	0.82	2,740	2,082	658	1,524	431	1,093
San Mateo	726,260	734,453	8,193	1.13	9,667	4,626	5,041	3,152	4,820	-1,668
Santa Barbara	421,337	425,710	4,373	1.04	5,998	2,884	3,114	1,259	1,884	-625
Santa Clara	1,790,272	1,820,176	29,904	1.67	26,347	8,454	17,893	12,011	12,867	-856
Santa Cruz	262,150	265,183	3,033	1.16	3,583	1,666	1,917	1,116	1,340	-224
Shasta	180,129	181,380	1,251	0.69	2,213	1,838	375	876	107	769
Sierra	3,464	3,400	-64	-1.85	14	37	-23	-41	1	-42
Siskiyou	45,618	45,695	77	0.17	532	533	-1	78	43	35
Solano	421,815	423,970	2,155	0.51	5,909	2,668	3,241	-1,086	1,637	-2,723
Sonoma	477,615	482,034	4,419	0.93	5,874	3,836	2,038	2,381	1,226	1,155
Stanislaus	515,660	523,095	7,435	1.44	8,918	3,598	5,320	2,115	1,959	156
Sutter	92,715	95,516	2,801	3.02	1,634	725	909	1,892	871	1,021
Tehama	61,369	62,093	724	1.18	839	641	198	526	109	417
Trinity	13,959	14,012	53	0.38	124	153	-29	82	6	76
Tulare	422,594	430,974	8,380	1.98	8,633	2,668	5,965	2,415	2,106	309
Tuolumne	56,882	56,910	28	0.05	497	620	-123	151	42	109
Ventura	818,803	826,550	7,747	0.95	12,442	5,120	7,322	425	3,575	-3,150
Yolo	193,262	197,530	4,268	2.21	2,689	1,121	1,568	2,700	949	1,751
Yuba	70,053	71,612	1,559	2.23	1,376	554	822	737	184	553
California	37,332,976	37,771,431	438,455	1.17	565,169	237,884	327,285	111,170	199,931	-88,761

**POPULATION PROJECTIONS BY RACE/ETHNICITY FOR  
CALIFORNIA AND ITS COUNTIES 2000-2050  
REPORT 06 P-1**

TABLE 1	TOTAL POPULATION					
	2000	2010	2020	2030	2040	2050
ALAMEDA	1,453,078	1,550,133	1,663,481	1,791,721	1,923,505	2,047,658
ALPINE	1,261	1,369	1,453	1,462	1,411	1,377
AMADOR	35,357	40,337	47,593	54,788	61,550	68,487
BUTTE	204,065	230,116	281,442	334,842	387,743	441,596
CALAVERAS	40,870	47,750	56,318	64,572	72,230	80,424
COLUSA	19,027	23,787	29,588	34,488	38,131	41,662
CONTRA COSTA	956,497	1,075,931	1,237,544	1,422,840	1,609,257	1,812,242
DEL NORTE	27,680	30,983	36,077	42,420	49,029	56,218
EL DORADO	158,621	189,308	221,140	247,570	280,720	314,126
FRESNO	804,508	983,478	1,201,792	1,429,228	1,670,542	1,928,411
GLENN	26,764	30,880	37,959	45,181	54,000	63,586
HUMBOLDT	126,839	134,785	142,167	147,217	150,121	152,333
IMPERIAL	143,763	189,675	239,149	283,693	334,951	387,763
INYO	18,181	19,183	20,495	22,132	23,520	25,112
KERN	665,519	871,728	1,086,113	1,352,627	1,707,239	2,106,024
KINGS	130,202	164,535	205,707	250,516	299,770	352,750
LAKE	58,724	67,530	77,912	87,066	96,885	106,887
LASSEN	34,108	37,918	42,394	47,240	51,596	55,989
LOS ANGELES	9,578,960	10,514,663	11,214,237	11,920,289	12,491,606	13,061,787
MADERA	124,696	162,114	212,874	273,456	344,455	413,569
MARIN	248,449	253,682	260,305	273,151	287,153	307,868
MARIPOSA	17,150	19,108	21,743	23,981	26,169	28,091
MENDOCINO	86,736	93,166	102,017	111,151	121,780	134,358
MERCED	211,481	273,935	348,690	439,905	541,161	652,355
MODOC	9,628	10,809	13,134	16,250	20,064	24,085
MONO	13,013	14,833	18,080	22,894	29,099	36,081
MONTEREY	404,031	433,283	476,642	529,145	584,878	646,590
NAPA	125,146	142,767	165,786	191,734	219,156	251,630
NEVADA	92,532	102,649	114,451	123,940	130,404	136,113
ORANGE	2,863,834	3,227,836	3,520,265	3,705,322	3,849,650	3,987,625
PLACER	252,223	347,543	428,535	512,509	625,964	751,208
PLUMAS	20,868	21,824	22,934	24,530	26,279	28,478
RIVERSIDE	1,559,039	2,239,053	2,904,848	3,507,498	4,103,182	4,730,922
SACRAMENTO	1,233,575	1,451,866	1,622,306	1,803,872	1,989,221	2,176,508
SAN BENITO	53,927	64,230	83,792	103,340	123,406	145,570
SAN BERNARDINO	1,721,942	2,177,596	2,581,371	2,958,939	3,309,292	3,662,193
SAN DIEGO	2,836,303	3,199,706	3,550,714	3,950,757	4,241,399	4,508,728
SAN FRANCISCO	781,209	818,163	844,466	854,675	858,532	854,852
SAN JOAQUIN	569,083	741,417	965,094	1,205,198	1,477,473	1,783,973
SAN LUIS OBISPO	248,322	269,734	293,540	316,613	338,760	364,748
SAN MATEO	711,031	736,667	761,455	786,069	807,587	819,125
SANTA BARBARA	401,115	434,497	459,498	484,570	509,920	534,447
SANTA CLARA	1,693,128	1,837,361	1,992,805	2,192,501	2,412,411	2,624,670
SANTA CRUZ	256,695	268,016	287,480	304,465	318,413	333,083
SHASTA	164,794	191,722	224,386	260,179	295,281	331,724
SIERRA	3,701	3,628	3,508	3,290	3,356	3,547
SISKIYOU	44,634	47,109	51,283	55,727	60,656	66,588
SOLANO	396,995	441,061	503,248	590,166	697,206	815,524
SONOMA	461,618	495,412	546,151	606,346	676,179	761,177
STANISLAUS	451,190	559,708	699,144	857,893	1,014,365	1,191,344
SUTTER	79,632	102,326	141,159	182,401	229,620	282,894
TEHAMA	56,130	65,593	79,484	93,477	108,345	124,475
TRINITY	13,155	15,172	18,236	22,136	26,030	30,209
TULARE	369,873	466,893	599,117	742,969	879,480	1,026,755
TUOLUMNE	54,863	58,721	64,161	67,510	70,325	73,291
VENTURA	758,884	855,876	956,392	1,049,758	1,135,684	1,229,737
YOLO	170,190	206,100	245,052	275,360	301,934	327,982
YUBA	60,598	80,411	109,216	137,322	168,040	201,327
CALIFORNIA	34,105,437	39,135,676	44,135,923	49,240,891	54,226,115	59,507,876

**COUNTY OF IMPERIAL**  
**2000-2005 HOUSING ELEMENT**

**JURG HEUBERGER, AICP, CEP**  
**Planning Director**

**Prepared By:**

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**#1177.00**

The exception of this low density aspect can be found in the several small rural unincorporated communities such as Heber, Seeley, Niland, Salton City and Palo Verde that have the basic infrastructure (to a lesser extent) associated with the incorporated cities. These small rural communities tend to be isolated from the cities. Beyond these small rural communities and located in the agricultural lands and the desert open space areas of the unincorporated County, there is a relatively small and geographically dispersed population that lacks the infrastructure associated with either the incorporated cities or the small rural communities.

The majority of the growth that occurs in the County tends to happen in the incorporated cities or in the areas surrounding the cities. The County has essentially established urban buffer areas around all the cities and communities located in agricultural areas (Please see the "Urban Areas" illustrated in the County General Plan Land Use Map provided in Appendix A of this Element). It is these buffer areas where growth outside of the incorporated cities tends to occur. Development in these areas is accomplished through the connection of services from a neighboring city, annexation into the city, or the establishment of new services to support the development. Growth outside of the "urban area" tends to be on a single lot basis. With the exception of a few small districts, neither major subdivisions nor major developments typically occur in the unincorporated areas outside of the "urban areas" due to the County's rural character, lack of available infrastructure and the agricultural based activities.

## **2. County Growth Trends**

The best available source of demographic information is the federal census, which is conducted once every ten years. The Population Research Unit of the California Department of Finance is the best source for annual population estimates. One problem with the federal census is that it does not take into account the seasonal population changes. Imperial County attracts many seasonal migratory workers and retired people, especially during the months of November through February.

### ***Population Characteristics***

Based on the 1990 census, the total population of Imperial County increased from 92,500 to 109,303 between 1980 and 1990, an increase of 16,803 persons or 18.2 percent. The unincorporated area increased from 24,459 to 27,339 persons in the same period of time. This 11.8 percent increase represents a population growth of 2,880 persons in the unincorporated area and highlights the lower population growth in the unincorporated areas when compared to the County as a whole. Based on April 1998 SCAG estimates, the year 2000 population of Imperial County is 148,980, with an estimated 39,422 people living in unincorporated areas.

There are a number of potential factors that may support an accelerated population growth in the near future. These factors include: growth of the geothermal industry in the County; additional prisons; an additional USA/Mexico border crossing; the possible expansion of the U.S. Naval Air Facility; and a possible regional airport.

### ***Household Characteristics***

A household is any group of people living together in a residence, whether related or unrelated. A survey of household characteristics is useful to determine household size trends, income, overcrowding or under-utilization of housing, and the number of special needs households such as large families and female-headed households.

According to the 1997 Housing Survey there were an estimated 4,388 households in the unincorporated portions of the County in 1997. Approximately 24.5 percent of the households were renter-occupied, while the remaining 75.5 percent were owner-occupied.

The average household size was estimated to be 3.45 persons per household. Further, larger households with five or more persons per household comprised 29.7 percent of the community, while three or four person households constituted 36.8 percent of the households in the unincorporated County.

As depicted in Table 1, approximately 66 percent of the owner- and renter-occupied households in the unincorporated County have annual incomes below 80 percent of the area median income, meaning 2/3 of the households are considered lower income households. In addition, Table 1 also shows that a majority of renter households have annual incomes less than 50 percent of the median income, or 60 percent of the renter households are considered very low income.

# 2004 Regional Transportation Plan/ Growth Vision:

## SOCIO-ECONOMIC FORECAST REPORT

June 2004



## Counties and Subregions

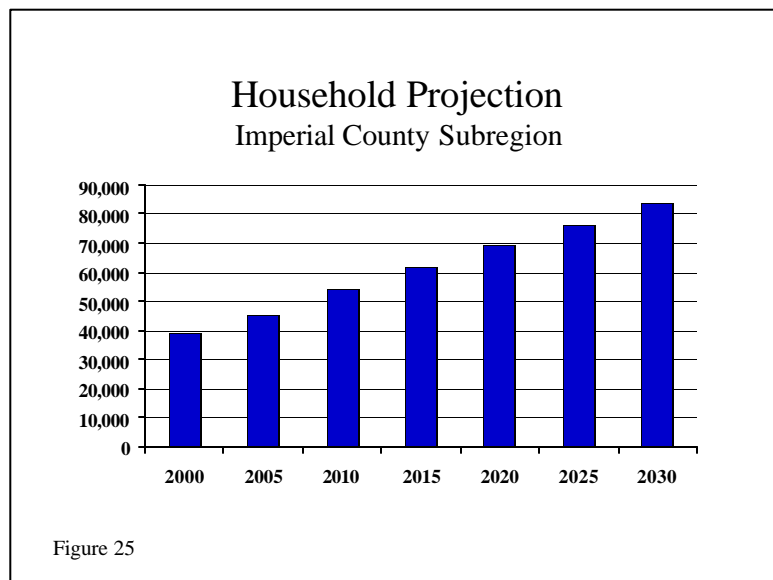
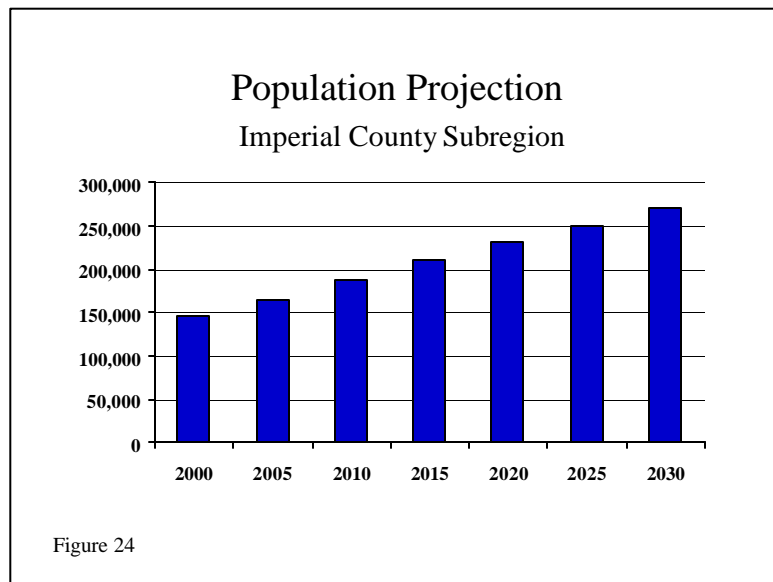
### Imperial County Subregion

#### Population and Households

Imperial County shares a border with Mexico and is primarily agricultural. The county currently has about 1 percent of the SCAG regional population and about 1 percent of the households. The 2000 July figure shows that the population is 147,000 with 39,500 households.










Imperial County's population is projected to be 270,000 in 2030, an 84 percent increase from its 2000 population. The number of households is projected to be 84,000 in 2030, up 112 percent from 2000. Based on the SCAG adopted 2004 RTP Socioeconomic Forecast, the Imperial County population and households are expected to grow at a faster pace than the regional average. Population is projected to grow at an annual rate of 2.8 percent and households are projected to grow at annual rate of 3.7 percent.

















The County's rapid growth rate is primarily a result of the large Hispanic population in the county. In 2000, seventy two percent of the Imperial County population was Hispanic. Hispanics have the highest fertility rate,



































## **Appendix K**

















### **Year 2012 Intersection LOS Calculations**

















						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	13	2	8	30	26	24
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	14	2	9	33	28	26
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			16		65	15
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			16		65	15
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			99		97	98
cM capacity (veh/h)			1601		935	1064
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	16	41	54			
Volume Left	0	9	28			
Volume Right	2	0	26			
cSH	1700	1601	993			
Volume to Capacity	0.01	0.01	0.05			
Queue Length 95th (ft)	0	0	4			
Control Delay (s)	0.0	1.6	8.8			
Lane LOS		A	A			
Approach Delay (s)	0.0	1.6	8.8			
Approach LOS			A			
Intersection Summary						
Average Delay		4.9				
Intersection Capacity Utilization		18.5%	ICU Level of Service	A		
Analysis Period (min)		15				

















												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	0	0	2	0	33	0	18	0	0	5	11
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	2	0	36	0	20	0	0	5	12
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)						2						
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	49	31	11	31	37	20	17			20		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	49	31	11	31	37	20	17			20		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	100	100	97	100			100		
cM capacity (veh/h)	919	862	1069	977	855	1058	1600			1597		
Direction, Lane #	WB 1	NB 1	SB 1									
Volume Total	38	20	17									
Volume Left	2	0	0									
Volume Right	36	0	12									
cSH	1123	1600	1700									
Volume to Capacity	0.03	0.00	0.01									
Queue Length 95th (ft)	3	0	0									
Control Delay (s)	8.5	0.0	0.0									
Lane LOS	A											
Approach Delay (s)	8.5	0.0	0.0									
Approach LOS	A											
Intersection Summary												
Average Delay			4.3									
Intersection Capacity Utilization			13.3%	ICU Level of Service						A		
Analysis Period (min)			15									










												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	14	1	0	0	0	0	0	0	1	8	3	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	15	1	0	0	0	0	0	0	1	9	3	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)			2									
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	21	22	3	22	21	1	3			1		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	21	22	3	22	21	1	3			1		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	98	100	100	100	100	100	100			99		
cM capacity (veh/h)	987	867	1081	986	868	1084	1619			1622		
Direction, Lane #	EB 1	NB 1	SB 1									
Volume Total	16	1	12									
Volume Left	15	0	9									
Volume Right	0	1	0									
cSH	936	1700	1622									
Volume to Capacity	0.02	0.00	0.01									
Queue Length 95th (ft)	1	0	0									
Control Delay (s)	8.9	0.0	5.3									
Lane LOS	A		A									
Approach Delay (s)	8.9	0.0	5.3									
Approach LOS	A											
Intersection Summary												
Average Delay		7.1										
Intersection Capacity Utilization		17.2%		ICU Level of Service					A			
Analysis Period (min)		15										

















												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	0	0	13	0	151	2	41	0	0	101	11
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	14	0	164	2	45	0	0	110	12
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)						2						
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	247	165	116	165	171	45	122			45		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	247	165	116	165	171	45	122			45		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	98	100	84	100			100		
cM capacity (veh/h)	593	727	937	799	721	1025	1466			1564		
Direction, Lane #	WB 1	NB 1	SB 1									
Volume Total	178	47	122									
Volume Left	14	2	0									
Volume Right	164	0	12									
cSH	1114	1466	1700									
Volume to Capacity	0.16	0.00	0.07									
Queue Length 95th (ft)	14	0	0									
Control Delay (s)	9.2	0.4	0.0									
Lane LOS	A	A										
Approach Delay (s)	9.2	0.4	0.0									
Approach LOS	A											
Intersection Summary												
Average Delay			4.8									
Intersection Capacity Utilization			19.3%	ICU Level of Service						A		
Analysis Period (min)			15									

















												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	6	0	3	0	0	0	0	39	23	65	48	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	7	0	3	0	0	0	0	42	25	71	52	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)			2									
Median type								None			None	
Median storage veh												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	248	261	52	250	248	55	52			67		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	248	261	52	250	248	55	52			67		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	99	100	100	100	100	100	100			95		
cM capacity (veh/h)	680	614	1015	677	624	1012	1554			1534		
Direction, Lane #	EB 1	NB 1	SB 1									
Volume Total	10	67	123									
Volume Left	7	0	71									
Volume Right	3	25	0									
cSH	1021	1700	1534									
Volume to Capacity	0.01	0.04	0.05									
Queue Length 95th (ft)	1	0	4									
Control Delay (s)	9.7	0.0	4.4									
Lane LOS	A		A									
Approach Delay (s)	9.7	0.0	4.4									
Approach LOS	A											
Intersection Summary												
Average Delay			3.2									
Intersection Capacity Utilization			22.8%			ICU Level of Service				A		
Analysis Period (min)			15									

















												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	0	0	19	1	227	19	56	0	0	180	49
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	21	1	247	21	61	0	0	196	53
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)						2						
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	448	324	222	324	351	61	249			61		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	448	324	222	324	351	61	249			61		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	97	100	75	98			100		
cM capacity (veh/h)	387	584	817	621	564	1004	1317			1542		
Direction, Lane #	WB 1	NB 1	SB 1									
Volume Total	268	82	249									
Volume Left	21	21	0									
Volume Right	247	0	53									
cSH	1093	1317	1700									
Volume to Capacity	0.25	0.02	0.15									
Queue Length 95th (ft)	24	1	0									
Control Delay (s)	9.9	2.1	0.0									
Lane LOS	A	A										
Approach Delay (s)	9.9	2.1	0.0									
Approach LOS	A											
Intersection Summary												
Average Delay			4.7									
Intersection Capacity Utilization			29.6%	ICU Level of Service						A		
Analysis Period (min)			15									

















												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	37	0	3	0	0	0	0	38	20	154	44	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	40	0	3	0	0	0	0	41	22	167	48	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)			2									
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	435	446	48	436	435	52	48			63		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	435	446	48	436	435	52	48			63		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	92	100	100	100	100	100	100			89		
cM capacity (veh/h)	487	452	1021	485	459	1015	1559			1540		
Direction, Lane #	EB 1	NB 1	SB 1									
Volume Total	43	63	215									
Volume Left	40	0	167									
Volume Right	3	22	0									
cSH	527	1700	1540									
Volume to Capacity	0.08	0.04	0.11									
Queue Length 95th (ft)	7	0	9									
Control Delay (s)	12.7	0.0	6.1									
Lane LOS	B		A									
Approach Delay (s)	12.7	0.0	6.1									
Approach LOS	B											
Intersection Summary												
Average Delay			5.8									
Intersection Capacity Utilization			27.5%			ICU Level of Service				A		
Analysis Period (min)			15									

















						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	24	14	25	11	2	8
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	26	15	27	12	2	9
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			41		100	34
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			41		100	34
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			98		100	99
cM capacity (veh/h)			1568		883	1040
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	41	39	11			
Volume Left	0	27	2			
Volume Right	15	0	9			
cSH	1700	1568	1004			
Volume to Capacity	0.02	0.02	0.01			
Queue Length 95th (ft)	0	1	1			
Control Delay (s)	0.0	5.1	8.6			
Lane LOS		A	A			
Approach Delay (s)	0.0	5.1	8.6			
Approach LOS			A			
Intersection Summary						
Average Delay		3.2				
Intersection Capacity Utilization		18.6%		ICU Level of Service		A
Analysis Period (min)		15				

















													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Volume (veh/h)	0	0	0	1	3	4	0	6	0	0	19	21	
Sign Control	Stop			Stop			Free			Free			
Grade	0%			0%			0%			0%			
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	
Hourly flow rate (vph)	0	0	0	1	3	4	0	7	0	0	21	23	
Pedestrians													
Lane Width (ft)													
Walking Speed (ft/s)													
Percent Blockage													
Right turn flare (veh)						2							
Median type								None		None			
Median storage veh)													
Upstream signal (ft)													
pX, platoon unblocked													
vC, conflicting volume	42	39	32	39	50	7	43						7
vC1, stage 1 conf vol													
vC2, stage 2 conf vol													
vCu, unblocked vol	42	39	32	39	50	7	43						7
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1						4.1
tC, 2 stage (s)													
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2						2.2
p0 queue free %	100	100	100	100	100	100	100						100
cM capacity (veh/h)	954	854	1042	966	841	1076	1565						1614
Direction, Lane #	WB 1	NB 1	SB 1										
Volume Total	9	7	43										
Volume Left	1	0	0										
Volume Right	4	0	23										
cSH	1745	1565	1700										
Volume to Capacity	0.00	0.00	0.03										
Queue Length 95th (ft)	0	0	0										
Control Delay (s)	8.8	0.0	0.0										
Lane LOS	A												
Approach Delay (s)	8.8	0.0	0.0										
Approach LOS	A												
Intersection Summary													
Average Delay				1.3									
Intersection Capacity Utilization				13.3%	ICU Level of Service			A					
Analysis Period (min)				15									

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	6	0	3	0	0	0	0	0	6	20	1	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	7	0	3	0	0	0	0	0	7	22	1	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)			2									
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	48	51	1	49	48	3	1			7		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	48	51	1	49	48	3	1			7		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	99	100	100	100	100	100	100			99		
cM capacity (veh/h)	943	829	1083	938	832	1081	1622			1614		
Direction, Lane #	EB 1	NB 1	SB 1									
Volume Total	10	7	23									
Volume Left	7	0	22									
Volume Right	3	7	0									
cSH	1415	1700	1614									
Volume to Capacity	0.01	0.00	0.01									
Queue Length 95th (ft)	1	0	1									
Control Delay (s)	8.7	0.0	6.9									
Lane LOS	A		A									
Approach Delay (s)	8.7	0.0	6.9									
Approach LOS	A											
Intersection Summary												
Average Delay			6.2									
Intersection Capacity Utilization			17.8%			ICU Level of Service				A		
Analysis Period (min)			15									

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	0	0	20	0	58	2	32	0	0	144	19
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	22	0	63	2	35	0	0	157	21
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)						2						
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	238	206	167	206	216	35	177			35		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	238	206	167	206	216	35	177			35		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	97	100	94	100			100		
cM capacity (veh/h)	673	690	877	751	681	1038	1399			1577		
Direction, Lane #	WB 1	NB 1	SB 1									
Volume Total	85	37	177									
Volume Left	22	2	0									
Volume Right	63	0	21									
cSH	1396	1399	1700									
Volume to Capacity	0.06	0.00	0.10									
Queue Length 95th (ft)	5	0	0									
Control Delay (s)	9.0	0.5	0.0									
Lane LOS	A	A										
Approach Delay (s)	9.0	0.5	0.0									
Approach LOS	A											
Intersection Summary												
Average Delay			2.6									
Intersection Capacity Utilization			18.7%	ICU Level of Service						A		
Analysis Period (min)			15									

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	9	1	2	0	0	0	0	27	23	108	60	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	10	1	2	0	0	0	0	29	25	117	65	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)			2									
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	342	354	65	343	342	42	65			54		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	342	354	65	343	342	42	65			54		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	98	100	100	100	100	100	100			92		
cM capacity (veh/h)	577	528	999	573	536	1029	1537			1551		
Direction, Lane #	EB 1	NB 1	SB 1									
Volume Total	13	54	183									
Volume Left	10	0	117									
Volume Right	2	25	0									
cSH	686	1700	1551									
Volume to Capacity	0.02	0.03	0.08									
Queue Length 95th (ft)	1	0	6									
Control Delay (s)	10.9	0.0	5.0									
Lane LOS	B		A									
Approach Delay (s)	10.9	0.0	5.0									
Approach LOS	B											
Intersection Summary												
Average Delay			4.3									
Intersection Capacity Utilization			25.8%			ICU Level of Service				A		
Analysis Period (min)			15									

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	0	0	19	3	170	16	69	0	0	263	59
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	21	3	185	17	75	0	0	286	64
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)						2						
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	522	428	318	428	460	75	350			75		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	522	428	318	428	460	75	350			75		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	96	99	81	99			100		
cM capacity (veh/h)	372	512	723	531	491	986	1209			1524		
Direction, Lane #	WB 1	NB 1	SB 1									
Volume Total	209	92	350									
Volume Left	21	17	0									
Volume Right	185	0	64									
cSH	1114	1209	1700									
Volume to Capacity	0.19	0.01	0.21									
Queue Length 95th (ft)	17	1	0									
Control Delay (s)	9.8	1.6	0.0									
Lane LOS	A	A										
Approach Delay (s)	9.8	1.6	0.0									
Approach LOS	A											
Intersection Summary												
Average Delay			3.4									
Intersection Capacity Utilization			27.4%	ICU Level of Service						A		
Analysis Period (min)			15									










												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	57	0	1	0	0	0	0	32	19	244	54	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	62	0	1	0	0	0	0	35	21	265	59	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)			2									
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	634	645	59	635	634	45	59			55		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	634	645	59	635	634	45	59			55		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	82	100	100	100	100	100	100			83		
cM capacity (veh/h)	340	324	1007	339	329	1025	1545			1549		
Direction, Lane #	EB 1	NB 1	SB 1									
Volume Total	63	55	324									
Volume Left	62	0	265									
Volume Right	1	21	0									
cSH	346	1700	1549									
Volume to Capacity	0.18	0.03	0.17									
Queue Length 95th (ft)	16	0	15									
Control Delay (s)	17.8	0.0	6.6									
Lane LOS	C		A									
Approach Delay (s)	17.8	0.0	6.6									
Approach LOS	C											
Intersection Summary												
Average Delay		7.4										
Intersection Capacity Utilization		33.0%		ICU Level of Service					A			
Analysis Period (min)		15										

## **Appendix L**

### **Year 2012 + Project with Drew I/C Open Intersection LOS Calculations**










AM 2012 + Project  
1: Evan Hewes Hwy & Dunaway Rd

Drew Interchange Open  
HCM Unsignalized Intersection Capacity Analysis

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	13	2	38	30	26	25
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	14	2	41	33	28	27
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			16		130	15
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			16		130	15
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			97		97	97
cM capacity (veh/h)			1601		841	1064
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	16	74	55			
Volume Left	0	41	28			
Volume Right	2	0	27			
cSH	1700	1601	938			
Volume to Capacity	0.01	0.03	0.06			
Queue Length 95th (ft)	0	2	5			
Control Delay (s)	0.0	4.2	9.1			
Lane LOS		A	A			
Approach Delay (s)	0.0	4.2	9.1			
Approach LOS			A			
Intersection Summary						
Average Delay			5.6			
Intersection Capacity Utilization			20.3%	ICU Level of Service		A
Analysis Period (min)			15			

















AM 2012 + Project  
2: Project Access & Dunaway Rd

Drew Interchange Open  
HCM Unsignalized Intersection Capacity Analysis

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	5	1	51	270	30	16
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	5	1	55	293	33	17
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	285	202			349	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	285	202			349	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	99	100			97	
cM capacity (veh/h)	686	839			1210	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	7	349	50			
Volume Left	5	0	33			
Volume Right	1	293	0			
cSH	708	1700	1210			
Volume to Capacity	0.01	0.21	0.03			
Queue Length 95th (ft)	1	0	2			
Control Delay (s)	10.1	0.0	5.3			
Lane LOS	B		A			
Approach Delay (s)	10.1	0.0	5.3			
Approach LOS	B					
Intersection Summary						
Average Delay		0.8				
Intersection Capacity Utilization		36.0%		ICU Level of Service	A	
Analysis Period (min)		15				

















AM 2012 + Project  
3: I-8 WB Ramp & Dunaway Rd

Drew Interchange Open  
HCM Unsignalized Intersection Capacity Analysis

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	0	0	2	0	258	0	63	0	0	9	12
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	2	0	280	0	68	0	0	10	13
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)						2						
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	225	85	16	85	91	68	23			68		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	225	85	16	85	91	68	23			68		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	100	100	72	100			100		
cM capacity (veh/h)	525	805	1063	902	799	995	1592			1533		
Direction, Lane #	WB 1	NB 1	SB 1									
Volume Total	283	68	23									
Volume Left	2	0	0									
Volume Right	280	0	13									
cSH	1002	1592	1700									
Volume to Capacity	0.28	0.00	0.01									
Queue Length 95th (ft)	29	0	0									
Control Delay (s)	10.0	0.0	0.0									
Lane LOS	B											
Approach Delay (s)	10.0	0.0	0.0									
Approach LOS	B											
Intersection Summary												
Average Delay			7.6									
Intersection Capacity Utilization			26.0%	ICU Level of Service						A		
Analysis Period (min)			15									

















AM 2012 + Project  
4: I-8 EB Ramp & Dunaway Rd

Drew Interchange Open  
HCM Unsignalized Intersection Capacity Analysis

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	59	1	0	0	0	0	0	0	1	12	3	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	64	1	0	0	0	0	0	0	1	13	3	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)			2									
Median type								None			None	
Median storage veh												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	30	30	3	30	30	1	3			1		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	30	30	3	30	30	1	3			1		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	93	100	100	100	100	100	100			99		
cM capacity (veh/h)	973	855	1081	971	856	1084	1619			1622		
Direction, Lane #	EB 1	NB 1	SB 1									
Volume Total	65	1	16									
Volume Left	64	0	13									
Volume Right	0	1	0									
cSH	960	1700	1622									
Volume to Capacity	0.07	0.00	0.01									
Queue Length 95th (ft)	5	0	1									
Control Delay (s)	9.0	0.0	5.8									
Lane LOS	A		A									
Approach Delay (s)	9.0	0.0	5.8									
Approach LOS	A											
Intersection Summary												
Average Delay		8.3										
Intersection Capacity Utilization		17.5%		ICU Level of Service					A			
Analysis Period (min)		15										

















AM 2012 + Project  
5: I-8 WB Ramp & Drew Rd

Drew Interchange Open  
HCM Unsignalized Intersection Capacity Analysis

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	0	0	13	0	151	32	42	0	0	101	41
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	14	0	164	35	46	0	0	110	45
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)						2						
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	329	247	132	247	270	46	154			46		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	329	247	132	247	270	46	154			46		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	98	100	84	98			100		
cM capacity (veh/h)	514	639	917	693	621	1024	1426			1562		
Direction, Lane #	WB 1	NB 1	SB 1									
Volume Total	178	80	154									
Volume Left	14	35	0									
Volume Right	164	0	45									
cSH	1112	1426	1700									
Volume to Capacity	0.16	0.02	0.09									
Queue Length 95th (ft)	14	2	0									
Control Delay (s)	9.3	3.4	0.0									
Lane LOS	A	A										
Approach Delay (s)	9.3	3.4	0.0									
Approach LOS	A											
Intersection Summary												
Average Delay			4.7									
Intersection Capacity Utilization			25.1%	ICU Level of Service						A		
Analysis Period (min)			15									

















AM 2012 + Project  
6: I-8 EB Ramp & Drew Rd

Drew Interchange Open  
HCM Unsignalized Intersection Capacity Analysis

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	7	0	4	0	0	0	0	69	23	65	48	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	8	0	4	0	0	0	0	75	25	71	52	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)			2									
Median type								None			None	
Median storage veh												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	281	293	52	283	281	88	52			100		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	281	293	52	283	281	88	52			100		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	99	100	100	100	100	100	100			95		
cM capacity (veh/h)	647	588	1015	642	598	971	1554			1493		
Direction, Lane #	EB 1	NB 1	SB 1									
Volume Total	12	100	123									
Volume Left	8	0	71									
Volume Right	4	25	0									
cSH	1017	1700	1493									
Volume to Capacity	0.01	0.06	0.05									
Queue Length 95th (ft)	1	0	4									
Control Delay (s)	9.9	0.0	4.5									
Lane LOS	A		A									
Approach Delay (s)	9.9	0.0	4.5									
Approach LOS	A											
Intersection Summary												
Average Delay			2.9									
Intersection Capacity Utilization			22.8%			ICU Level of Service				A		
Analysis Period (min)			15									

















AM 2012 + Project  
7: I-8 WB Ramp & Forrester Road

Drew Interchange Open  
HCM Unsignalized Intersection Capacity Analysis

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	0	0	19	1	227	49	57	0	0	180	94
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	21	1	247	53	62	0	0	196	102
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)						2						
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	539	415	247	415	466	62	298			62		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	539	415	247	415	466	62	298			62		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	96	100	75	96			100		
cM capacity (veh/h)	330	506	792	530	473	1003	1263			1541		
Direction, Lane #	WB 1	NB 1	SB 1									
Volume Total	268	115	298									
Volume Left	21	53	0									
Volume Right	247	0	102									
cSH	1091	1263	1700									
Volume to Capacity	0.25	0.04	0.18									
Queue Length 95th (ft)	24	3	0									
Control Delay (s)	9.9	3.9	0.0									
Lane LOS	A	A										
Approach Delay (s)	9.9	3.9	0.0									
Approach LOS	A											
Intersection Summary												
Average Delay			4.6									
Intersection Capacity Utilization			34.2%	ICU Level of Service						A		
Analysis Period (min)			15									










AM 2012 + Project  
8: I-8 EB Ramp & Forrester Road

Drew Interchange Open  
HCM Unsignalized Intersection Capacity Analysis

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	38	0	4	0	0	0	0	68	20	154	44	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	41	0	4	0	0	0	0	74	22	167	48	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)			2									
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	467	478	48	470	467	85	48			96		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	467	478	48	470	467	85	48			96		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	91	100	100	100	100	100	100			89		
cM capacity (veh/h)	462	432	1021	459	438	974	1559			1498		
Direction, Lane #	EB 1	NB 1	SB 1									
Volume Total	46	96	215									
Volume Left	41	0	167									
Volume Right	4	22	0									
cSH	511	1700	1498									
Volume to Capacity	0.09	0.06	0.11									
Queue Length 95th (ft)	7	0	9									
Control Delay (s)	13.1	0.0	6.2									
Lane LOS	B		A									
Approach Delay (s)	13.1	0.0	6.2									
Approach LOS	B											
Intersection Summary												
Average Delay			5.4									
Intersection Capacity Utilization			27.5%			ICU Level of Service				A		
Analysis Period (min)			15									










PM 2012 + Project  
1: Evan Hewes Hwy & Dunaway Rd

Drew Interchange Open  
HCM Unsignalized Intersection Capacity Analysis

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	24	14	26	11	2	38
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	26	15	28	12	2	41
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			41		102	34
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			41		102	34
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			98		100	96
cM capacity (veh/h)			1568		880	1040
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	41	40	43			
Volume Left	0	28	2			
Volume Right	15	0	41			
cSH	1700	1568	1030			
Volume to Capacity	0.02	0.02	0.04			
Queue Length 95th (ft)	0	1	3			
Control Delay (s)	0.0	5.2	8.6			
Lane LOS		A	A			
Approach Delay (s)	0.0	5.2	8.6			
Approach LOS			A			
Intersection Summary						
Average Delay		4.7				
Intersection Capacity Utilization		18.7%	ICU Level of Service	A		
Analysis Period (min)		15				

















PM 2012 + Project  
2: Project Access & Dunaway Rd

Drew Interchange Open  
HCM Unsignalized Intersection Capacity Analysis

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	270	30	11	14	1	40
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	293	33	12	15	1	43
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	65	20			27	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	65	20			27	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	69	97			100	
cM capacity (veh/h)	940	1058			1587	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	326	27	45			
Volume Left	293	0	1			
Volume Right	33	15	0			
cSH	950	1700	1587			
Volume to Capacity	0.34	0.02	0.00			
Queue Length 95th (ft)	38	0	0			
Control Delay (s)	10.8	0.0	0.2			
Lane LOS	B		A			
Approach Delay (s)	10.8	0.0	0.2			
Approach LOS	B					
Intersection Summary						
Average Delay		8.8				
Intersection Capacity Utilization		26.8%		ICU Level of Service	A	
Analysis Period (min)		15				

















PM 2012 + Project  
3: I-8 WB Ramp & Dunaway Rd

Drew Interchange Open  
HCM Unsignalized Intersection Capacity Analysis

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	0	0	1	3	16	0	8	0	0	244	66
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	1	3	17	0	9	0	0	265	72
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)						2						
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	320	310	301	310	346	9	337			9		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	320	310	301	310	346	9	337			9		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	100	99	98	100			100		
cM capacity (veh/h)	620	605	739	643	577	1073	1222			1611		
Direction, Lane #	WB 1	NB 1	SB 1									
Volume Total	22	9	337									
Volume Left	1	0	0									
Volume Right	17	0	72									
cSH	1341	1222	1700									
Volume to Capacity	0.02	0.00	0.20									
Queue Length 95th (ft)	1	0	0									
Control Delay (s)	8.9	0.0	0.0									
Lane LOS	A											
Approach Delay (s)	8.9	0.0	0.0									
Approach LOS	A											
Intersection Summary												
Average Delay			0.5									
Intersection Capacity Utilization			26.9%	ICU Level of Service						A		
Analysis Period (min)			15									

















PM 2012 + Project  
4: I-8 EB Ramp & Dunaway Rd

Drew Interchange Open  
HCM Unsignalized Intersection Capacity Analysis

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	8	0	3	0	0	0	0	0	6	245	1	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	9	0	3	0	0	0	0	0	7	266	1	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)			2									
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	537	540	1	539	537	3	1			7		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	537	540	1	539	537	3	1			7		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	98	100	100	100	100	100	100			84		
cM capacity (veh/h)	397	375	1083	395	376	1081	1622			1614		
Direction, Lane #	EB 1	NB 1	SB 1									
Volume Total	12	7	267									
Volume Left	9	0	266									
Volume Right	3	7	0									
cSH	546	1700	1614									
Volume to Capacity	0.02	0.00	0.16									
Queue Length 95th (ft)	2	0	15									
Control Delay (s)	12.6	0.0	7.6									
Lane LOS	B		A									
Approach Delay (s)	12.6	0.0	7.6									
Approach LOS	B											
Intersection Summary												
Average Delay			7.7									
Intersection Capacity Utilization			30.3%		ICU Level of Service					A		
Analysis Period (min)			15									

















PM 2012 + Project  
5: I-8 WB Ramp & Drew Rd

Drew Interchange Open  
HCM Unsignalized Intersection Capacity Analysis

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	0	0	20	0	58	3	62	0	0	144	20
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	22	0	63	3	67	0	0	157	22
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)						2						
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	273	241	167	241	252	67	178			67		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	273	241	167	241	252	67	178			67		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	97	100	94	100			100		
cM capacity (veh/h)	635	659	877	711	650	996	1398			1534		
Direction, Lane #	WB 1	NB 1	SB 1									
Volume Total	85	71	178									
Volume Left	22	3	0									
Volume Right	63	0	22									
cSH	1339	1398	1700									
Volume to Capacity	0.06	0.00	0.10									
Queue Length 95th (ft)	5	0	0									
Control Delay (s)	9.2	0.4	0.0									
Lane LOS	A	A										
Approach Delay (s)	9.2	0.4	0.0									
Approach LOS	A											
Intersection Summary												
Average Delay			2.4									
Intersection Capacity Utilization			18.8%	ICU Level of Service						A		
Analysis Period (min)			15									

















PM 2012 + Project  
6: I-8 EB Ramp & Drew Rd

Drew Interchange Open  
HCM Unsignalized Intersection Capacity Analysis

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	69	1	32	0	0	0	0	28	23	108	60	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	75	1	35	0	0	0	0	30	25	117	65	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)			2									
Median type								None			None	
Median storage veh												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	343	355	65	361	343	43	65			55		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	343	355	65	361	343	43	65			55		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	87	100	97	100	100	100	100			92		
cM capacity (veh/h)	576	527	999	540	536	1027	1537			1549		
Direction, Lane #	EB 1	NB 1	SB 1									
Volume Total	111	55	183									
Volume Left	75	0	117									
Volume Right	35	25	0									
cSH	838	1700	1549									
Volume to Capacity	0.13	0.03	0.08									
Queue Length 95th (ft)	11	0	6									
Control Delay (s)	11.1	0.0	5.0									
Lane LOS	B		A									
Approach Delay (s)	11.1	0.0	5.0									
Approach LOS	B											
Intersection Summary												
Average Delay			6.2									
Intersection Capacity Utilization			26.3%			ICU Level of Service				A		
Analysis Period (min)			15									

















PM 2012 + Project  
7: I-8 WB Ramp & Forrester Road

Drew Interchange Open  
HCM Unsignalized Intersection Capacity Analysis

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	0	0	19	3	170	17	114	0	0	263	61
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	21	3	185	18	124	0	0	286	66
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)						2						
Median type								None			None	
Median storage veh												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	574	480	319	480	513	124	352			124		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	574	480	319	480	513	124	352			124		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	96	99	80	98			100		
cM capacity (veh/h)	338	478	722	490	458	927	1207			1463		
Direction, Lane #	WB 1	NB 1	SB 1									
Volume Total	209	142	352									
Volume Left	21	18	0									
Volume Right	185	0	66									
cSH	1047	1207	1700									
Volume to Capacity	0.20	0.02	0.21									
Queue Length 95th (ft)	19	1	0									
Control Delay (s)	10.2	1.2	0.0									
Lane LOS	B	A										
Approach Delay (s)	10.2	1.2	0.0									
Approach LOS	B											
Intersection Summary												
Average Delay			3.3									
Intersection Capacity Utilization			30.4%	ICU Level of Service						A		
Analysis Period (min)			15									

PM 2012 + Project  
8: I-8 EB Ramp & Forrester Road

Drew Interchange Open  
HCM Unsignalized Intersection Capacity Analysis

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	102	0	31	0	0	0	0	33	19	244	54	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	111	0	34	0	0	0	0	36	21	265	59	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)			2									
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	635	646	59	652	635	46	59			57		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	635	646	59	652	635	46	59			57		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	67	100	97	100	100	100	100			83		
cM capacity (veh/h)	340	324	1007	320	328	1023	1545			1548		
Direction, Lane #	EB 1	NB 1	SB 1									
Volume Total	145	57	324									
Volume Left	111	0	265									
Volume Right	34	21	0									
cSH	443	1700	1548									
Volume to Capacity	0.33	0.03	0.17									
Queue Length 95th (ft)	35	0	15									
Control Delay (s)	17.9	0.0	6.6									
Lane LOS	C		A									
Approach Delay (s)	17.9	0.0	6.6									
Approach LOS	C											
Intersection Summary												
Average Delay		9.0										
Intersection Capacity Utilization		35.3%		ICU Level of Service					A			
Analysis Period (min)		15										

## **Appendix M**

### **Year 2012+ Project with Drew I/C Closed Intersection LOS Calculations**










AM 2012 + Project  
1: Evan Hewes Hwy & Dunaway Rd

Drew Interchange Closed  
HCM Unsignalized Intersection Capacity Analysis

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↰			↱	↰	↱
Volume (veh/h)	13	2	53	30	26	25
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	14	2	58	33	28	27
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			16		163	15
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			16		163	15
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			96		96	97
cM capacity (veh/h)			1601		798	1064
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	16	90	55			
Volume Left	0	58	28			
Volume Right	2	0	27			
cSH	1700	1601	909			
Volume to Capacity	0.01	0.04	0.06			
Queue Length 95th (ft)	0	3	5			
Control Delay (s)	0.0	4.8	9.2			
Lane LOS		A	A			
Approach Delay (s)	0.0	4.8	9.2			
Approach LOS			A			
Intersection Summary						
Average Delay		5.8				
Intersection Capacity Utilization		21.2%	ICU Level of Service	A		
Analysis Period (min)		15				

















AM 2012 + Project  
2: Project Access & Dunaway Rd

Drew Interchange Closed  
HCM Unsignalized Intersection Capacity Analysis

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	5	1	51	255	45	16
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	5	1	55	277	49	17
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	309	194			333	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	309	194			333	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	99	100			96	
cM capacity (veh/h)	656	847			1227	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	7	333	66			
Volume Left	5	0	49			
Volume Right	1	277	0			
cSH	682	1700	1227			
Volume to Capacity	0.01	0.20	0.04			
Queue Length 95th (ft)	1	0	3			
Control Delay (s)	10.3	0.0	6.0			
Lane LOS	B		A			
Approach Delay (s)	10.3	0.0	6.0			
Approach LOS	B					
Intersection Summary						
Average Delay		1.2				
Intersection Capacity Utilization		35.1%		ICU Level of Service		A
Analysis Period (min)		15				

















AM 2012 + Project  
3: I-8 WB Ramp & Dunaway Rd

Drew Interchange Closed  
HCM Unsignalized Intersection Capacity Analysis

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	0	0	2	0	243	0	63	0	0	9	12
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	2	0	264	0	68	0	0	10	13
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)						2						
Median type								None			None	
Median storage veh												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	217	85	16	85	91	68	23			68		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	217	85	16	85	91	68	23			68		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	100	100	73	100			100		
cM capacity (veh/h)	543	805	1063	902	799	995	1592			1533		
Direction, Lane #	WB 1	NB 1	SB 1									
Volume Total	266	68	23									
Volume Left	2	0	0									
Volume Right	264	0	13									
cSH	1003	1592	1700									
Volume to Capacity	0.27	0.00	0.01									
Queue Length 95th (ft)	27	0	0									
Control Delay (s)	9.9	0.0	0.0									
Lane LOS	A											
Approach Delay (s)	9.9	0.0	0.0									
Approach LOS	A											
Intersection Summary												
Average Delay			7.4									
Intersection Capacity Utilization			25.0%	ICU Level of Service						A		
Analysis Period (min)			15									

















AM 2012 + Project  
4: I-8 EB Ramp & Dunaway Rd

Drew Interchange Closed  
HCM Unsignalized Intersection Capacity Analysis

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	59	1	0	0	0	0	0	0	1	12	3	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	64	1	0	0	0	0	0	0	1	13	3	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)			2									
Median type								None			None	
Median storage veh												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	30	30	3	30	30	1	3			1		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	30	30	3	30	30	1	3			1		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	93	100	100	100	100	100	100			99		
cM capacity (veh/h)	973	855	1081	971	856	1084	1619			1622		
Direction, Lane #	EB 1	NB 1	SB 1									
Volume Total	65	1	16									
Volume Left	64	0	13									
Volume Right	0	1	0									
cSH	960	1700	1622									
Volume to Capacity	0.07	0.00	0.01									
Queue Length 95th (ft)	5	0	1									
Control Delay (s)	9.0	0.0	5.8									
Lane LOS	A		A									
Approach Delay (s)	9.0	0.0	5.8									
Approach LOS	A											
Intersection Summary												
Average Delay		8.3										
Intersection Capacity Utilization		17.5%		ICU Level of Service					A			
Analysis Period (min)		15										

















AM 2012 + Project  
7: I-8 WB Ramp & Forrester Road

Drew Interchange Closed  
HCM Unsignalized Intersection Capacity Analysis

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	0	0	19	1	227	79	57	0	0	180	109
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	21	1	247	86	62	0	0	196	118
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)						2						
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	612	489	255	489	548	62	314			62		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	612	489	255	489	548	62	314			62		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	96	100	75	93			100		
cM capacity (veh/h)	289	447	784	464	413	1003	1246			1541		
Direction, Lane #	WB 1	NB 1	SB 1									
Volume Total	268	148	314									
Volume Left	21	86	0									
Volume Right	247	0	118									
cSH	1091	1246	1700									
Volume to Capacity	0.25	0.07	0.18									
Queue Length 95th (ft)	24	6	0									
Control Delay (s)	10.0	4.9	0.0									
Lane LOS	B	A										
Approach Delay (s)	10.0	4.9	0.0									
Approach LOS	B											
Intersection Summary												
Average Delay			4.7									
Intersection Capacity Utilization			36.8%	ICU Level of Service						A		
Analysis Period (min)			15									










AM 2012 + Project  
8: I-8 EB Ramp & Forrester Road

Drew Interchange Closed  
HCM Unsignalized Intersection Capacity Analysis

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	38	0	4	0	0	0	0	98	20	154	44	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	41	0	4	0	0	0	0	107	22	167	48	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)			2									
Median type								None			None	
Median storage veh												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	500	511	48	502	500	117	48			128		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	500	511	48	502	500	117	48			128		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	91	100	100	100	100	100	100			89		
cM capacity (veh/h)	439	413	1021	436	418	935	1559			1458		
Direction, Lane #	EB 1	NB 1	SB 1									
Volume Total	46	128	215									
Volume Left	41	0	167									
Volume Right	4	22	0									
cSH	485	1700	1458									
Volume to Capacity	0.09	0.08	0.11									
Queue Length 95th (ft)	8	0	10									
Control Delay (s)	13.5	0.0	6.3									
Lane LOS	B		A									
Approach Delay (s)	13.5	0.0	6.3									
Approach LOS	B											
Intersection Summary												
Average Delay			5.1									
Intersection Capacity Utilization			27.5%			ICU Level of Service				A		
Analysis Period (min)			15									










PM 2012 + Project  
1: Evan Hewes Hwy & Dunaway Rd

Drew Interchange Closed  
HCM Unsignalized Intersection Capacity Analysis

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	24	14	27	11	2	53
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	26	15	29	12	2	58
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			41		104	34
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			41		104	34
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			98		100	94
cM capacity (veh/h)			1568		877	1040
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	41	41	60			
Volume Left	0	29	2			
Volume Right	15	0	58			
cSH	1700	1568	1033			
Volume to Capacity	0.02	0.02	0.06			
Queue Length 95th (ft)	0	1	5			
Control Delay (s)	0.0	5.3	8.7			
Lane LOS		A	A			
Approach Delay (s)	0.0	5.3	8.7			
Approach LOS			A			
Intersection Summary						
Average Delay		5.2				
Intersection Capacity Utilization		18.8%		ICU Level of Service		A
Analysis Period (min)		15				

















PM 2012 + Project  
2: Project Access & Dunaway Rd

Drew Interchange Closed  
HCM Unsignalized Intersection Capacity Analysis

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	255	45	11	13	2	40
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	277	49	12	14	2	43
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	67	19			26	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	67	19			26	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	70	95			100	
cM capacity (veh/h)	937	1059			1588	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	326	26	46			
Volume Left	277	0	2			
Volume Right	49	14	0			
cSH	954	1700	1588			
Volume to Capacity	0.34	0.02	0.00			
Queue Length 95th (ft)	38	0	0			
Control Delay (s)	10.7	0.0	0.4			
Lane LOS	B		A			
Approach Delay (s)	10.7	0.0	0.4			
Approach LOS	B					
Intersection Summary						
Average Delay		8.8				
Intersection Capacity Utilization		27.3%		ICU Level of Service	A	
Analysis Period (min)		15				

















PM 2012 + Project  
3: I-8 WB Ramp & Dunaway Rd

Drew Interchange Closed  
HCM Unsignalized Intersection Capacity Analysis

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	0	0	1	3	15	0	8	0	0	229	66
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	1	3	16	0	9	0	0	249	72
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)						2						
Median type								None			None	
Median storage veh												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	303	293	285	293	329	9	321			9		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	303	293	285	293	329	9	321			9		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	100	99	98	100			100		
cM capacity (veh/h)	637	618	754	659	590	1073	1239			1611		
Direction, Lane #	WB 1	NB 1	SB 1									
Volume Total	21	9	321									
Volume Left	1	0	0									
Volume Right	16	0	72									
cSH	1359	1239	1700									
Volume to Capacity	0.02	0.00	0.19									
Queue Length 95th (ft)	1	0	0									
Control Delay (s)	8.9	0.0	0.0									
Lane LOS	A											
Approach Delay (s)	8.9	0.0	0.0									
Approach LOS	A											
Intersection Summary												
Average Delay			0.5									
Intersection Capacity Utilization			26.1%	ICU Level of Service						A		
Analysis Period (min)			15									

















PM 2012 + Project  
4: I-8 EB Ramp & Dunaway Rd

Drew Interchange Closed  
HCM Unsignalized Intersection Capacity Analysis

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	8	0	3	0	0	0	0	0	6	230	1	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	9	0	3	0	0	0	0	0	7	250	1	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)			2									
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	504	508	1	506	504	3	1			7		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	504	508	1	506	504	3	1			7		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	98	100	100	100	100	100	100			85		
cM capacity (veh/h)	421	396	1083	419	397	1081	1622			1614		
Direction, Lane #	EB 1	NB 1	SB 1									
Volume Total	12	7	251									
Volume Left	9	0	250									
Volume Right	3	7	0									
cSH	579	1700	1614									
Volume to Capacity	0.02	0.00	0.15									
Queue Length 95th (ft)	2	0	14									
Control Delay (s)	12.3	0.0	7.6									
Lane LOS	B		A									
Approach Delay (s)	12.3	0.0	7.6									
Approach LOS	B											
Intersection Summary												
Average Delay			7.6									
Intersection Capacity Utilization			29.5%			ICU Level of Service				A		
Analysis Period (min)			15									

















PM 2012 + Project  
7: I-8 WB Ramp & Forrester Road

Drew Interchange Closed  
HCM Unsignalized Intersection Capacity Analysis

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	0	0	19	3	170	19	129	0	0	263	62
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	21	3	185	21	140	0	0	286	67
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)						2						
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	595	501	320	501	535	140	353			140		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	595	501	320	501	535	140	353			140		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	96	99	80	98			100		
cM capacity (veh/h)	325	464	721	474	444	908	1205			1443		
Direction, Lane #	WB 1	NB 1	SB 1									
Volume Total	209	161	353									
Volume Left	21	21	0									
Volume Right	185	0	67									
cSH	1025	1205	1700									
Volume to Capacity	0.20	0.02	0.21									
Queue Length 95th (ft)	19	1	0									
Control Delay (s)	10.3	1.2	0.0									
Lane LOS	B	A										
Approach Delay (s)	10.3	1.2	0.0									
Approach LOS	B											
Intersection Summary												
Average Delay			3.2									
Intersection Capacity Utilization			32.8%	ICU Level of Service					A			
Analysis Period (min)			15									

PM 2012 + Project  
8: I-8 EB Ramp & Forrester Road

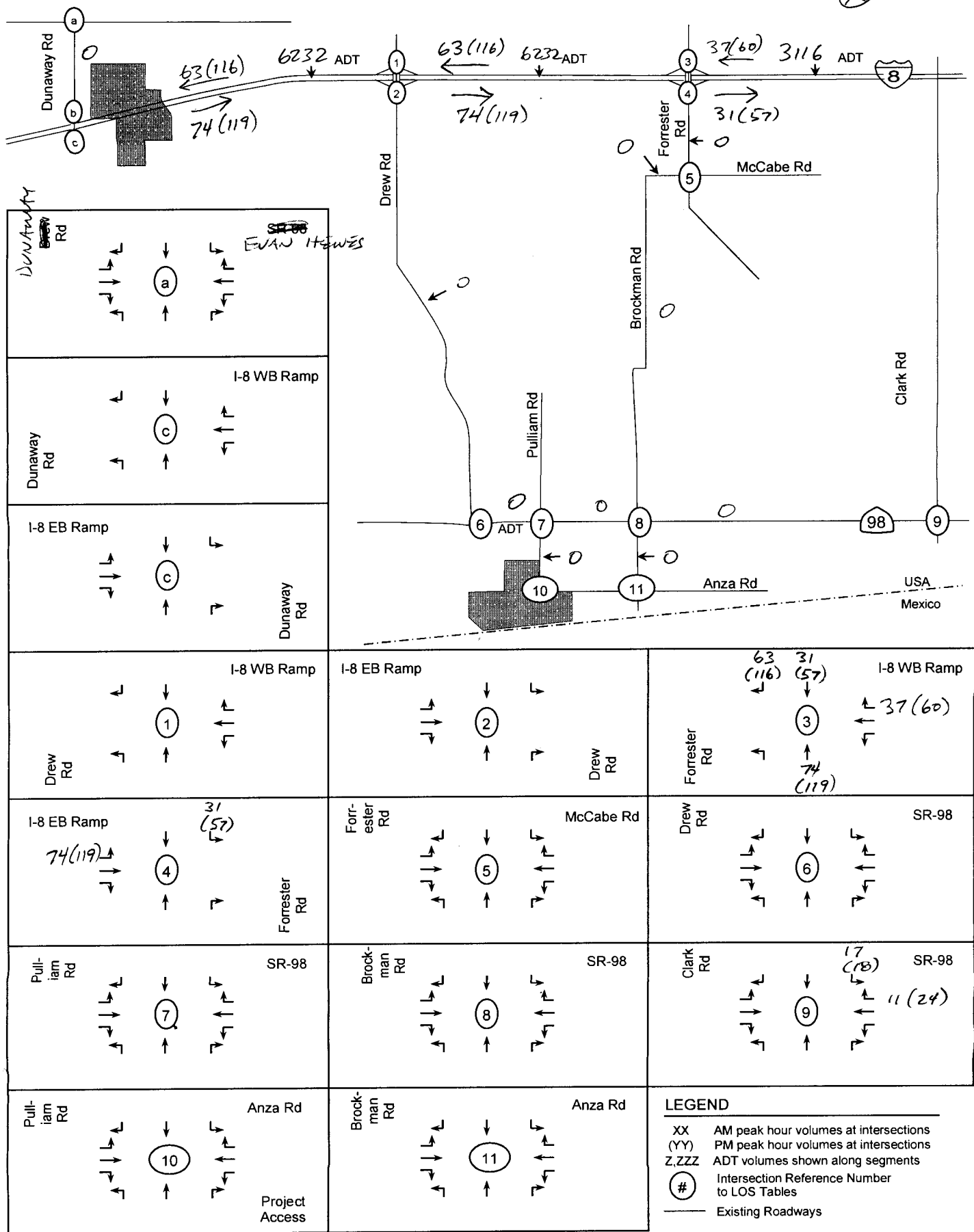
Drew Interchange Closed  
HCM Unsignalized Intersection Capacity Analysis

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	117	0	61	0	0	0	0	35	19	244	54	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	140	0	73	0	0	0	0	38	21	265	59	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)			2									
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	637	648	59	674	637	48	59			59		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	637	648	59	674	637	48	59			59		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	59	100	93	100	100	100	100			83		
cM capacity (veh/h)	338	323	1007	297	327	1020	1545			1545		
Direction, Lane #	EB 1	NB 1	SB 1									
Volume Total	213	59	324									
Volume Left	140	0	265									
Volume Right	73	21	0									
cSH	515	1700	1545									
Volume to Capacity	0.41	0.03	0.17									
Queue Length 95th (ft)	50	0	15									
Control Delay (s)	18.1	0.0	6.6									
Lane LOS	C		A									
Approach Delay (s)	18.1	0.0	6.6									
Approach LOS	C											
Intersection Summary												
Average Delay		10.1										
Intersection Capacity Utilization		36.8%		ICU Level of Service					A			
Analysis Period (min)		15										

## **Appendix N**

### **Cumulative Project (New Development) Data**

# CUMULATIVE : LAS ALDEAS



**Table 4.14-6 Project Trip Generation Summary (Continued)**

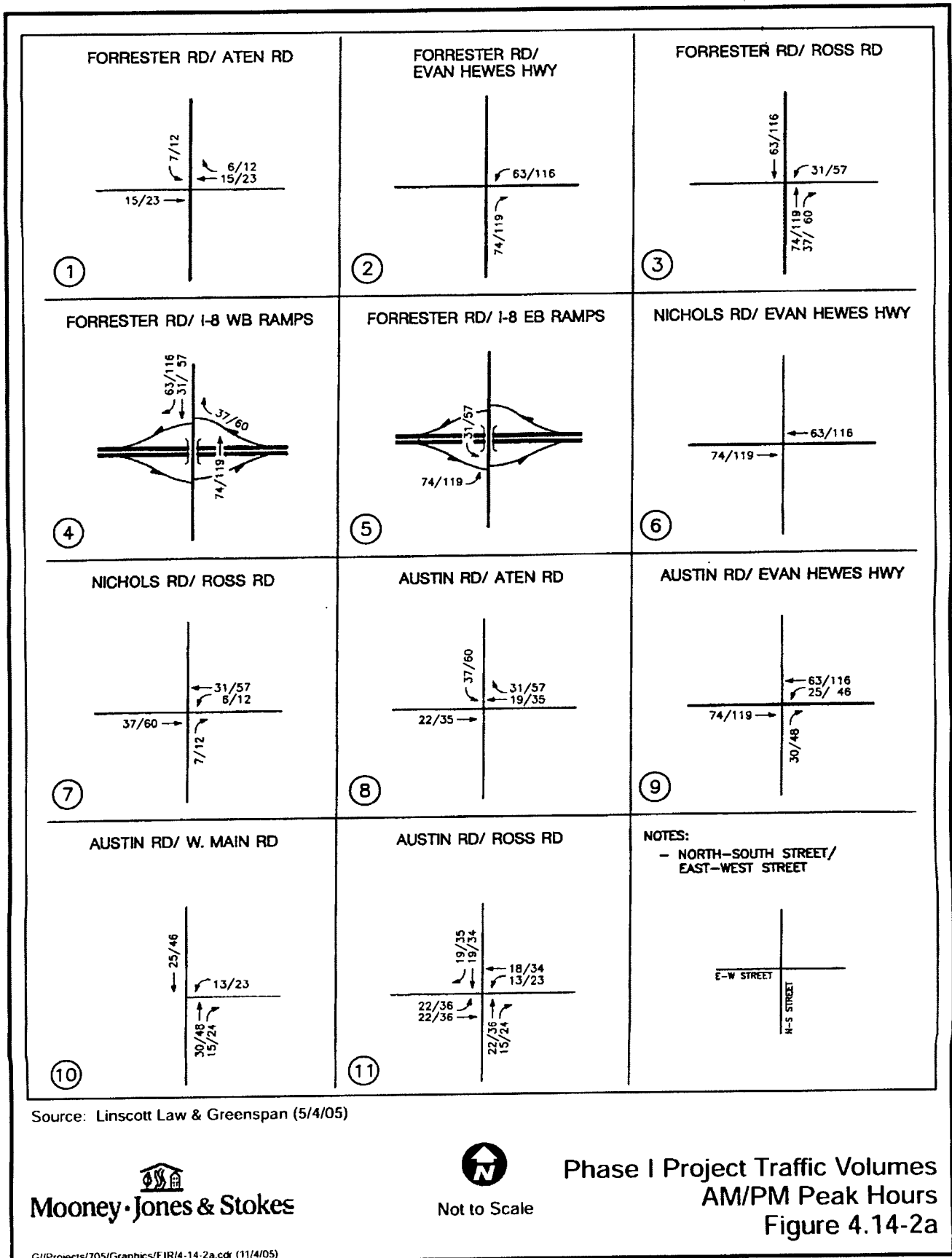
LAND USE	SIZE	DAILY TRIP ENDS		AM PEAK HOUR TRIPS				PM PEAK HOUR TRIPS			
		RATE <sup>1</sup>	ADT	% of ADT	IN:OUT SPLIT	VOLUME		% of ADT	IN:OUT SPLIT	VOLUME	
						IN	OUT			IN	OUT
<b>B. Phase 2 (Blocks 6-7)</b>											
Single Family Homes	285 DU	10 / DU	2,725	11	25:75	52	157	12	63:37	173	102
<b>C. Phase 3 (Blocks 8-9)</b>											
Single Family Homes	288 DU	10 / DU	2,752	11	25:75	53	158	12	63:37	175	103
<b>D: PHASE 4 (Blocks 10-11)</b>											
Single Family Homes	144 DU	10 / DU	1,454	11	25:75	28	82	12	63:37	94	55
Middle School	12.59 acres	10.0 / acre <sup>a</sup>	126	30%	60:40	23	15	9%	40:60	4	7
Park	12.59 acres	1.59 / acre	20	40%	50:50	3	3	50%	50:50	4	4
<b>E: PHASE 5 (Blocks 12-14)</b>											
Single Family Homes	448 DU	10 / DU	4,132	11	25:75	81	242	12	63:37	260	153
<b>F: PHASE 6 (Blocks 15-16)</b>											
Single Family Homes	404 DU	10 / DU	3,757	11	25:75	73	219	12	63:37	238	139
<b>G: PHASE 7 (Blocks 17-20)</b>											
Single Family Homes	152 DU	10 / DU	1,528	11	25:75	29	87	12	63:37	98	58
Multi-Family	371 DU	4 / DU	2,380	5	20:80	37	149	6	65:35	144	78
<b>Phase 1 Total:</b>			<b>22,679</b>	-	-	<b>741</b>	<b>628</b>	-	-	<b>1,190</b>	<b>1,148</b>
<b>Phase 2 – 7 Total:</b>			<b>18,874</b>	-	-	<b>379</b>	<b>1,112</b>	-	-	<b>1,190</b>	<b>699</b>
<b>TOTAL PROJECT:</b>			<b>41,553</b>	-	-	<b>1,120</b>	<b>1,740</b>	-	-	<b>2,380</b>	<b>1,847</b>

Source: ITE and SANDAG trip rates. See Appendix D for more detailed information.

a. One-fifth of SANDAG rate used since vast majority of middle school trips will be generated from within the site.

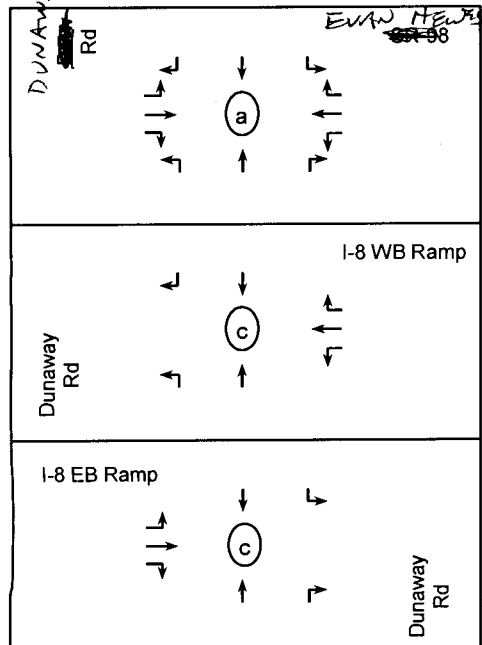
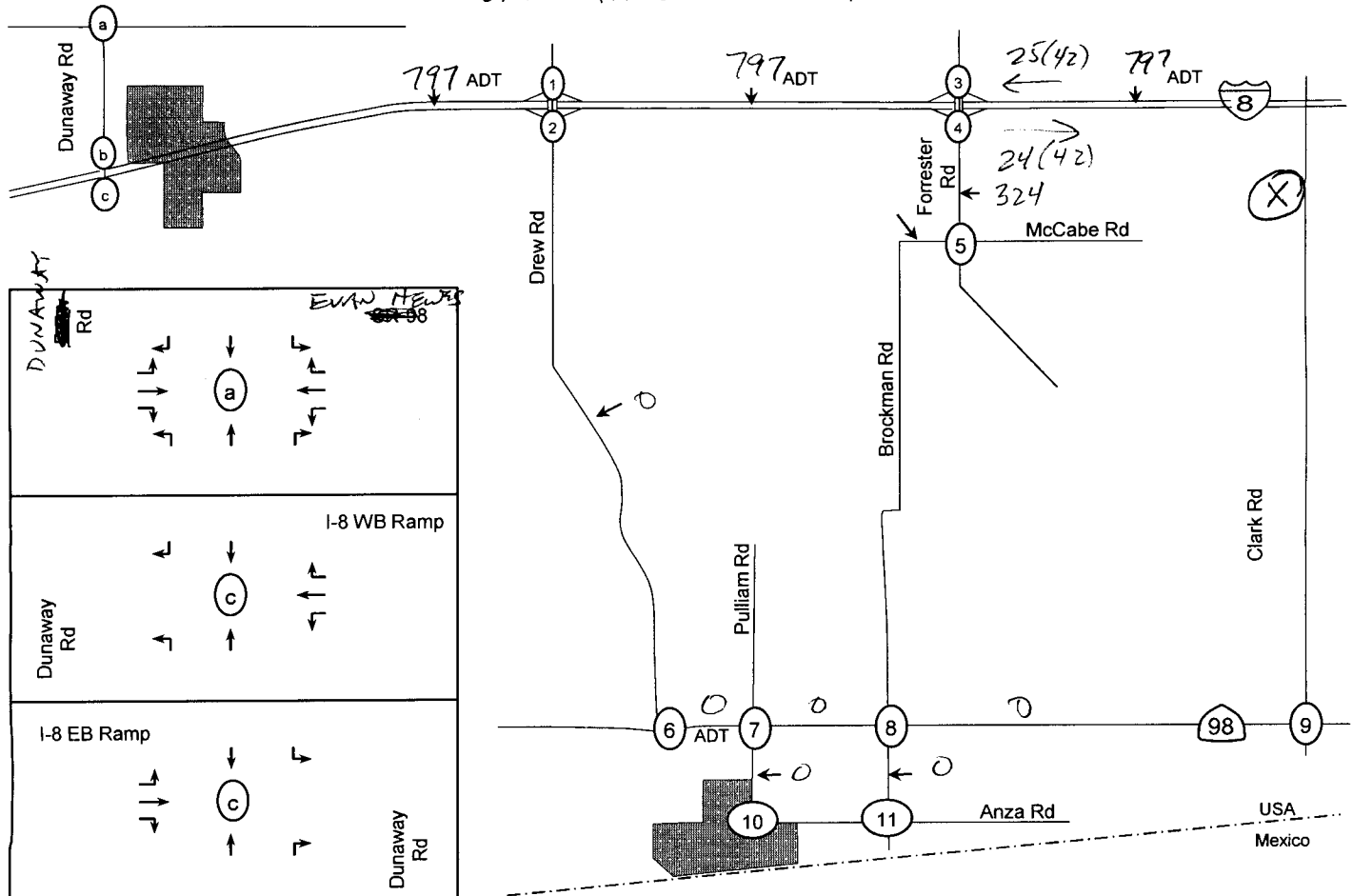
### Trip Assignment

The assignment of Specific Plan project traffic is based on Figure 4.14-1 and the location of each Specific Plan phase's access points. Figures 4.14-2 thru 4.14-8 illustrate the traffic volume assignments for each Specific Plan phase. Significant impacts resulting from Specific Plan project traffic are discussed below in Section 4.14.4.





CUMULATIVE: LINDA VISTA



		<div><b>LEGEND</b> XX AM peak hour volumes at intersections (YY) PM peak hour volumes at intersections Z,ZZZ ADT volumes shown along segments # Intersection Reference Number to LOS Tables — Existing Roadways</div>

## 8.0 CUMULATIVE PROJECTS

There are other planned projects in the areas adjacent to the project site that will add traffic to the roadways surrounding the project site. Based a review of potential projects in the City of El Centro, City of Calexico, and the County of Imperial, it was determined that thirty-four (34) near-term development projects should be included in the traffic study. The following is a brief description of these cumulative projects. *Figure 8-1* shows the total cumulative projects traffic volumes & *Figure 8-2* depicts the existing + project + cumulative projects traffic volumes. *Appendix E* contains more detailed information on the cumulative projects. There are several longer-term projects in the City of Calexico which are not included in the near-term cumulative scenario but are included in the 2030 cumulative scenario.

### 8.1 Description of Projects

**Linda Vista Mixed Use** proposes to develop 182 single-family dwelling units along with a 6-acre commercial lot. The project site is currently undeveloped agricultural land. Based on the trip generation calculations, the total project is calculated to generate 7,175 ADT with 109 inbound / 143 outbound trips during the AM peak hour and 349 inbound / 327 outbound trips during the PM peak hour. The traffic study for this project was prepared by LLG (August 2004).

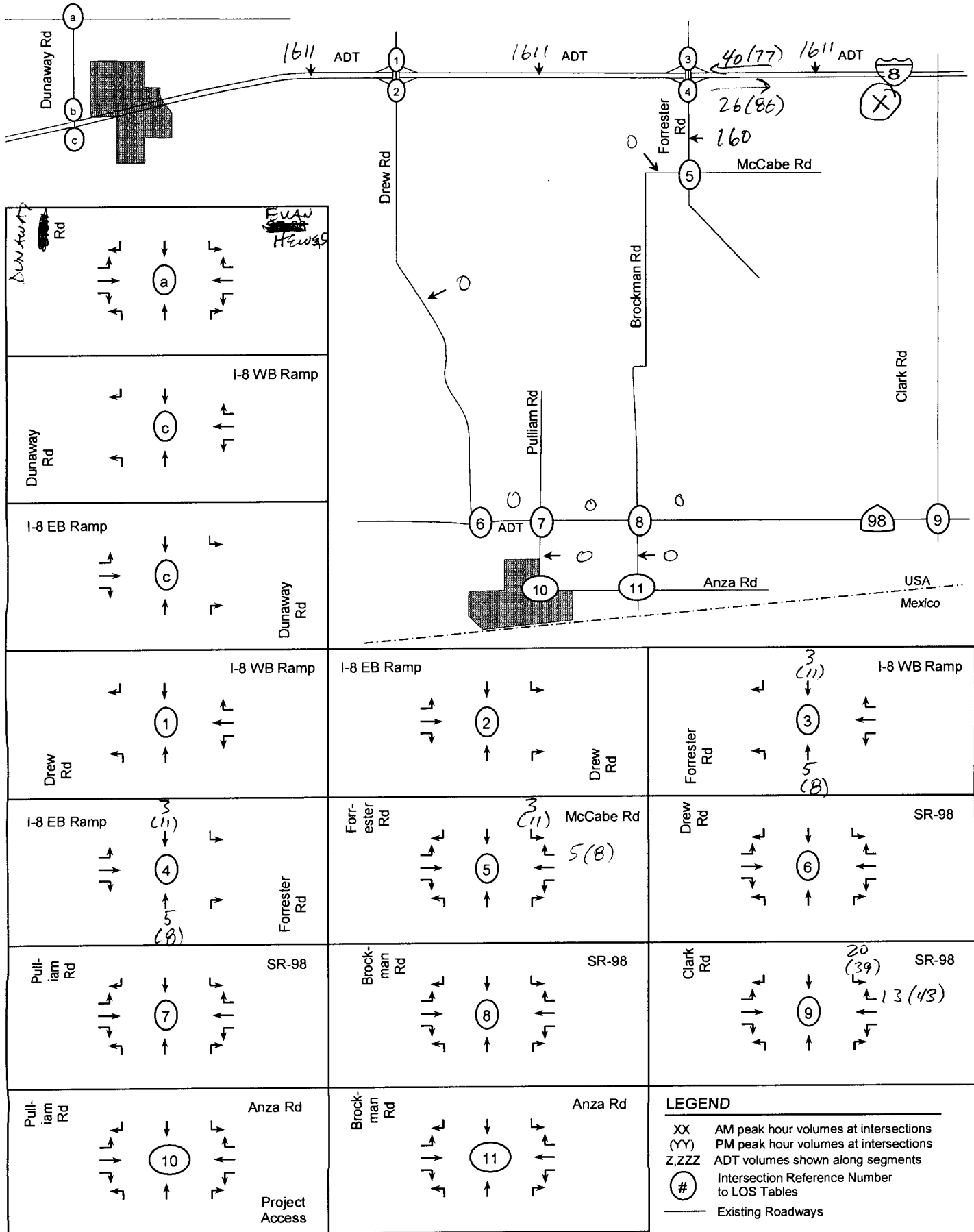
**Desert Village Mixed Use** proposes to develop 95 single-family residential homes along with 260 apartment units and 7.3 acres of commercial space. The project site is currently undeveloped agricultural land. Based on the trip generation calculations, the total project is calculated to generate 8,740 ADT with 129 inbound / 202 outbound trips during the AM peak hour and 431 inbound / 387 outbound trips during the PM peak hour. The traffic study for this project was prepared by LLG (February 2005).

**Countryside Estates** proposes to develop a 152-unit residential subdivision on 39.80 acres. The project site is currently undeveloped agricultural land. Based on the trip generation calculations, the total project is calculated to generate 1,530 ADT with 29 inbound / 87 outbound trips during the AM peak hour and 98 inbound / 58 outbound trips during the PM peak hour. The traffic study for this project was prepared by LLG (November 2004).

**Venezia Planned Community** proposes to develop approximately 250 single-family residential dwelling units and 135,100 square feet of commercial space. The project is located southeast of SR 98, east of Bowker Road and south of the All American Canal. The project is calculated to generate 12,140 ADT with 279 inbound / 279 outbound trips during the AM peak hour and 640 inbound / 576 outbound trips during the PM peak hour. The traffic study for this project was prepared by LLG (March 2005).

**The McCabe Ranch** proposes to develop 428 single-family residential dwelling units located south of Interstate 8 and west of Dogwood Road. The project is calculated to generate 3,550 ADT with 76 inbound / 206 outbound trips during the AM peak hour and 243 inbound / 142 outbound trips during the PM peak hour. The traffic study for this project was prepared by LLG (July 2002).

CUMULATIVE: DESERT VILLAGE #6



### 4.6.3 Impact Analysis

#### Project Trip Generation

The *ITE Trip Generation Manual* (7<sup>th</sup> Edition) was used to determine the traffic generated for the project. Project trips were calculated using the ITE fitted curve equations for each of the time periods analyzed. Given that the proposed project includes both commercial and residential uses, a 10% mixed use reduction was applied to the total calculated trip generation. Table 4.6-3 shows the trip generation estimates for the project. Based on the trip generation calculations, the total project is calculated to generate 8,740 ADT, with 129 inbound and 202 outbound trips during the AM peak hour, and 431 inbound and 387 outbound trips during the PM peak hour.

<b>Table 4.6-3</b>											
<b>Project Trip Generation</b>											
Land Use	Size	Daily Trip Ends		AM Peak Hour Trips				PM Peak Hour Trips			
		Rate	ADT	Rate	In:Out Split	Volume		Rate	In:Out Split	Volume	
						In	Out			In	Out
Residential: Single Family Detached	95 DU <sup>1</sup>	<sup>2</sup>	992	<sup>3</sup>	25:75	19	57	<sup>4</sup>	63:37	64	38
Residential: Apartments	260 DU	<sup>5</sup>	1,713	<sup>6</sup>	20:80	26	105	<sup>7</sup>	65:35	105	56
Commercial: Shopping Center	7.3 acres <sup>8</sup>	<sup>9</sup>	7,006	<sup>10</sup>	61:39	98	63	<sup>11</sup>	48:52	310	336
<b>Total:</b>	-	-	9,711	-	-	143	225	-	-	479	430
<b>10% Mixed-Use Reduction</b>			970			14	23			48	43
<b>Net Project Traffic</b>			8,740			129	202			431	387

**General Notes:**

Average Daily Trips (ADT) rounded to nearest 10.

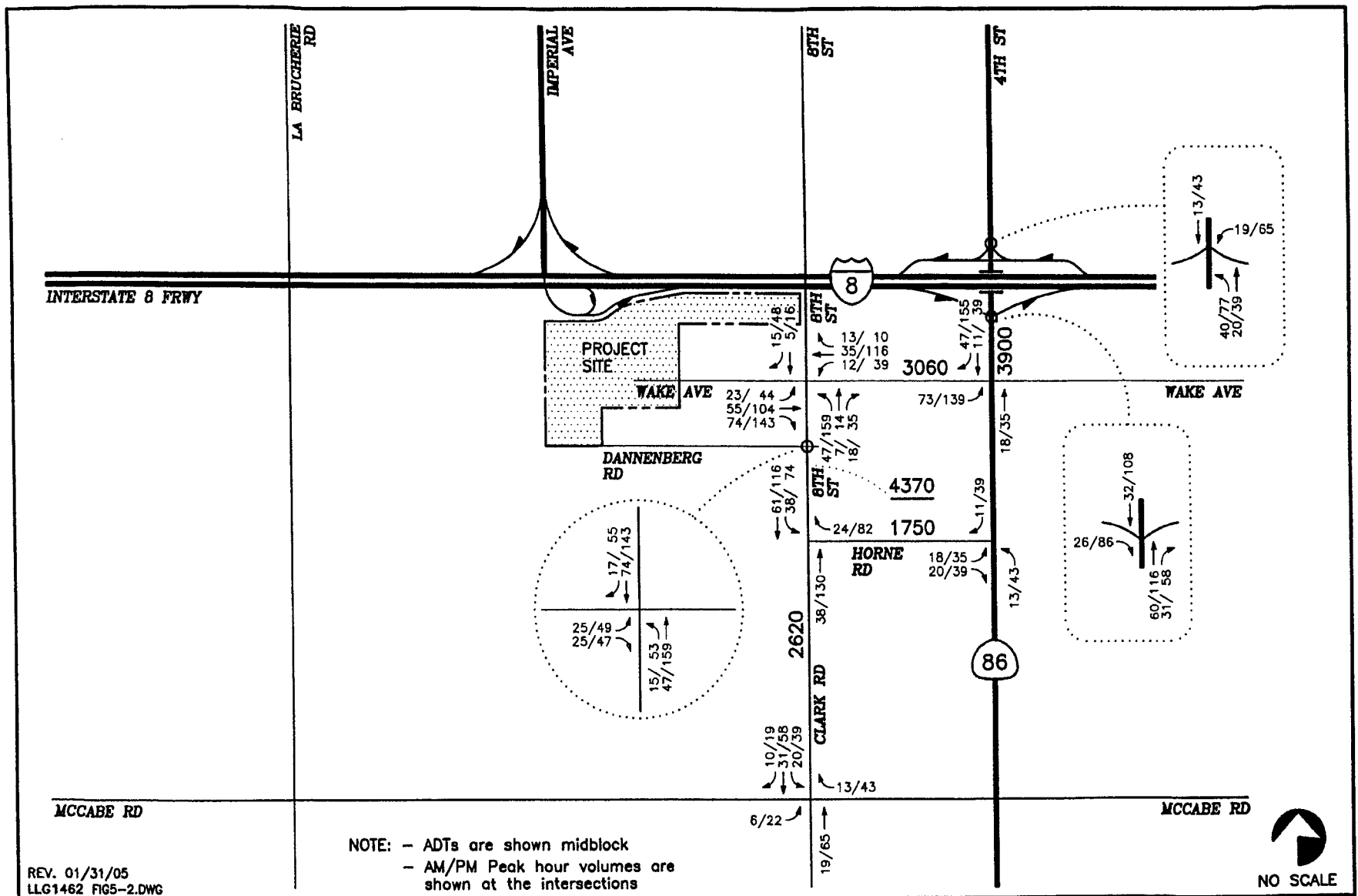
**Footnotes:**

1. Dwelling Unit
2.  $\ln(T) = 0.92 \ln(x) + 2.71$
3.  $T = 0.70(x) + 9.43$
4.  $\ln(T) = 0.90 \ln(x) + 0.53$
5.  $T = 6.01(x) + 150.35$
6.  $T = 0.49(x) + 3.73$
7.  $\ln(T) = 0.82 \ln(x) + 0.32$
8. Coverage of 33% was assumed (104,936 square feet)
9.  $\ln(T) = 0.65 \ln(x) + 5.83$
10.  $\ln(T) = 0.60 \ln(x) + 2.29$
11.  $\ln(T) = 0.66 \ln(x) + 3.40$

Source : LLG, 2004

#### Trip Distribution

The distribution of project traffic to the surrounding circulation system was based on the project's proximity to state highways and arterials, the locations of neighboring cities (Calexico and El Centro) and the proximity of local schools, businesses and housing. It was assumed that a small portion of project trips would be oriented west to east on I-8. The distribution is illustrated in Figure 4.6-3.



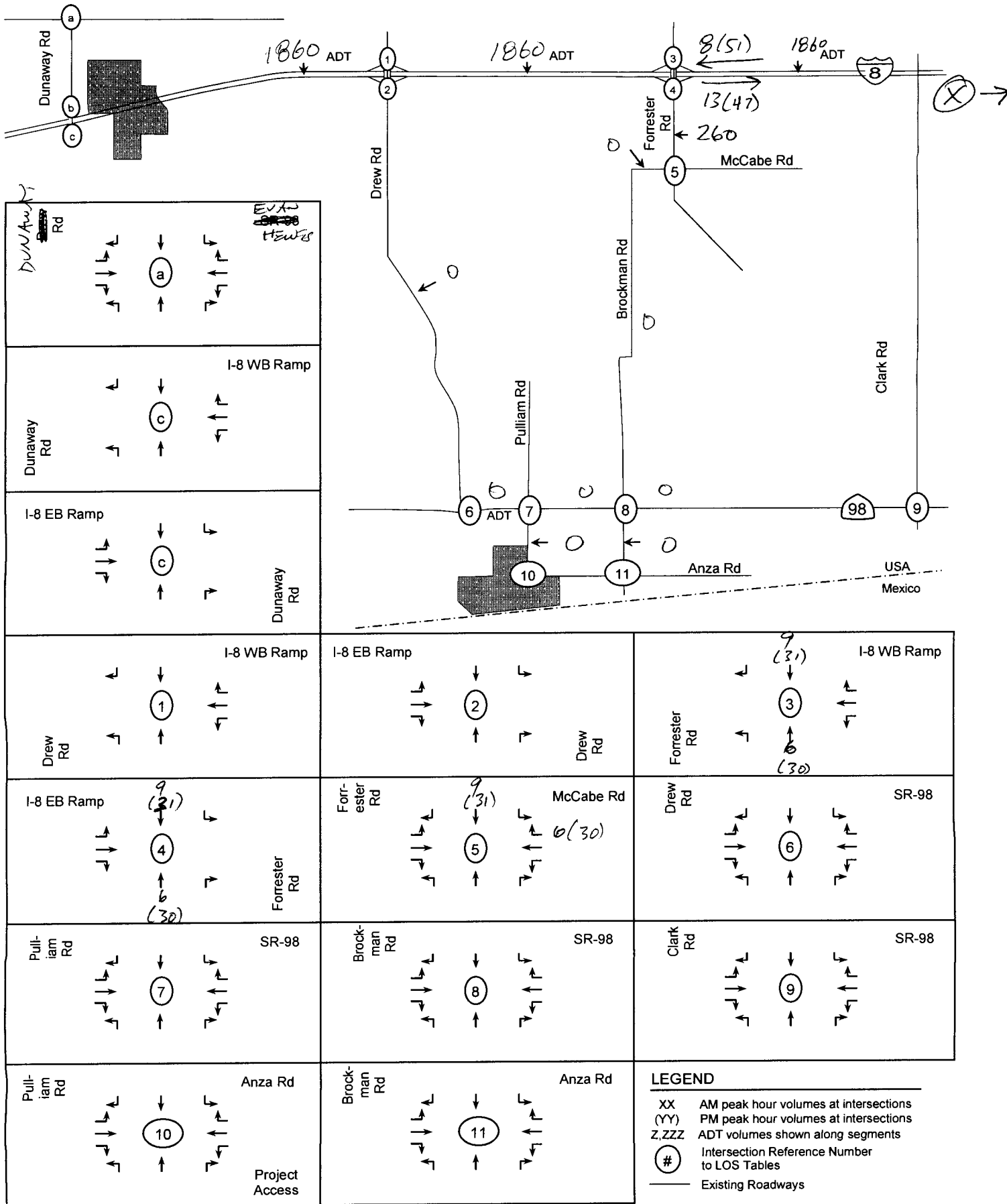
REV. 01/31/05  
LLG1462 FIG5-2.DWG

LINSCOTT  
LAW &  
GREENSPAN  
engineers

**Figure 5-2**  
**PROJECT TRAFFIC VOLUMES**  
**AM/PM PEAK HOURS & ADTs**  
**DESERT VILLAGE MIXED USE**

# CUMULATIVE: COMMONS.

4



was determined using the ITE Trip Generation Handbook equation for pass-by trips. Table 4.13-9 shows the trip generation estimates for the project. Appendix F of the Traffic Report contains copies of the ITE Trip Generation Equations referenced

Based on the trip generation calculations and the mixed-use reduction, the proposed project is calculated to generate 20,648 ADT, with 262 inbound and 168 outbound trips during the AM peak hour, and 933 inbound and 1,010 outbound trips during the PM peak hour.

**Table 4.13-9  
Project Trip Generation**

Use	Size	Daily Trip Ends (ADT <sup>a</sup> )		AM Peak Hour				PM Peak Hour			
		Rate <sup>b</sup>	Volume	% of ADT	In:Out	Volume	% of ADT	In:Out	Volume		
					Split	In		Out	Split	In	Out
Commercial: Regional Shopping Center	780,000 SF <sup>c</sup>	<sup>d</sup>	25,810	<sup>e</sup>	61:39	327	210	<sup>f</sup>	48:52	1,166	1,263
Pass-By Trip Reduction	—	20% <sup>g</sup>	(5,162)	—	—	(65)	(42)	—	—	(233)	(253)
<b>Total</b>		—	<b>20,648</b>	—	—	<b>262</b>	<b>168</b>	—	—	<b>933</b>	<b>1,010</b>

**General Notes:**

Source: ITE Trip Generation Manual (7<sup>th</sup> Edition)

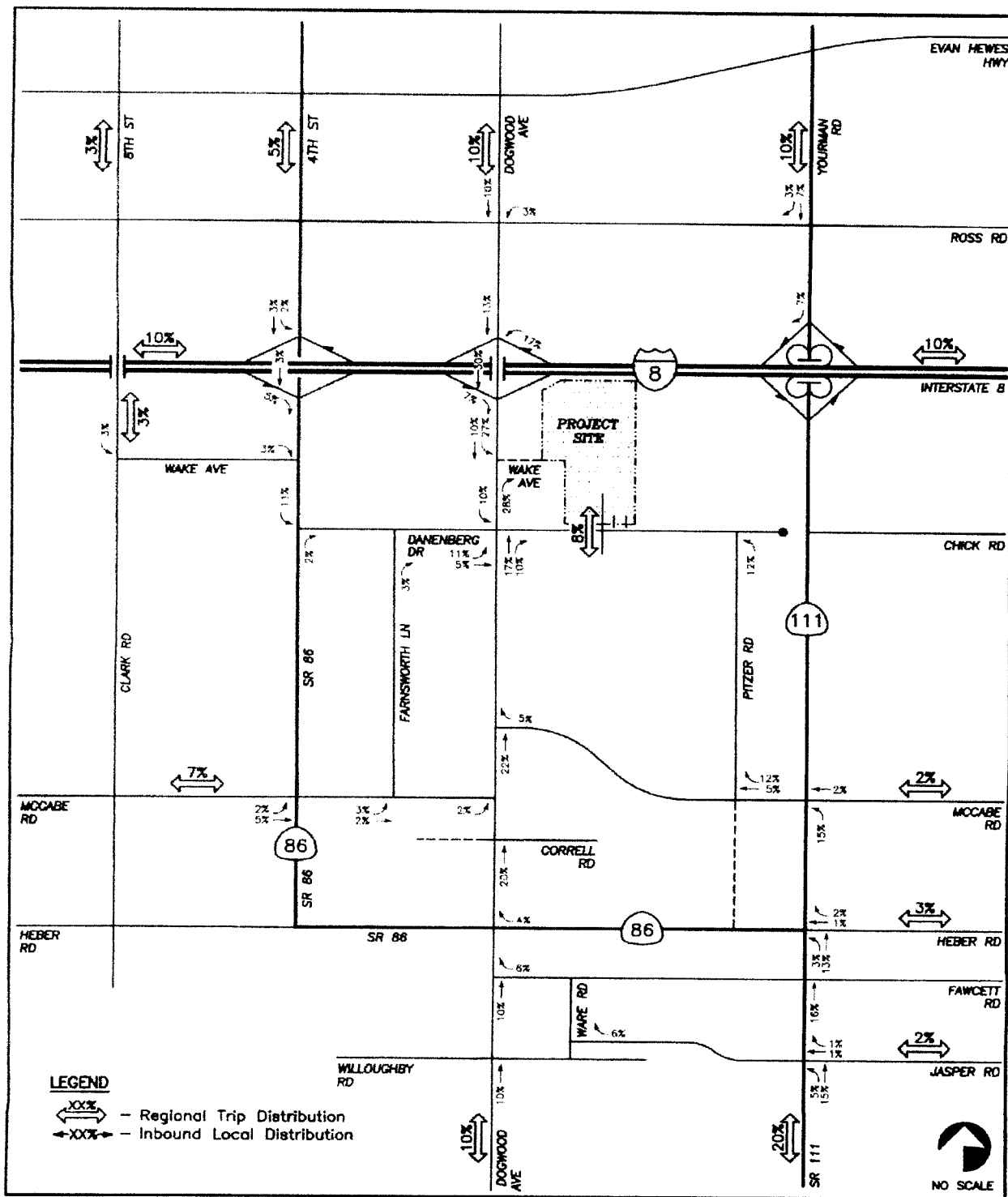
**Footnotes:**

- a. Average Daily Traffic volume
- b. Trip end per 1,000 square feet
- c. Square Feet
- d. ITE Trip Generation Equation:  $\ln(T) = 0.65 \ln(x) + 5.83$
- e. ITE Trip Generation Equation:  $\ln(T) = 0.60 \ln(x) + 2.29$
- f. ITE Trip Generation Equation:  $\ln(T) = 0.66 \ln(x) + 3.40$
- g. A 20% pass-by trip reduction (obtained from the ITE Trip Generation Handbook) was taken to account for those drivers already on the roadways within the study area.

***Trip Distribution & Assignment***

The project traffic was distributed and assigned to the street system based on a) the project's proximity to state highways and arterials; b) the locations of neighboring cities such as Calexico and the more distant cities of San Diego, CA and Yuma, AZ; and c) local schools, businesses and housing. The proximity to the international border with Mexico was also factored into the distribution.

Figure 4.13-3 depicts the regional trip distribution in the project area; Figure 4.13-4 illustrates the project traffic volume assignment. Figure 4.13-5 shows the existing traffic volumes with the addition of the project traffic.



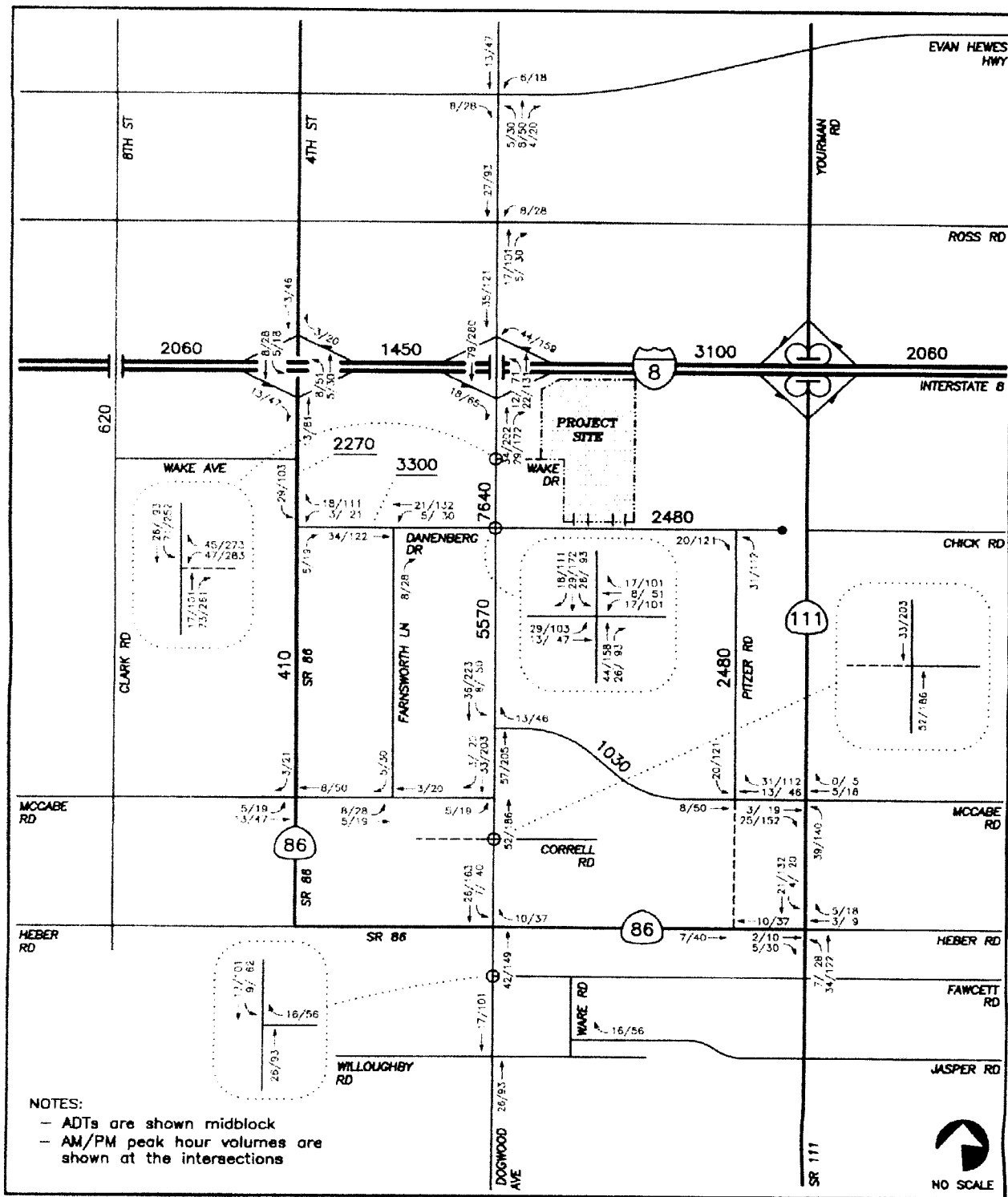
Source: Linscott Law & Greenspan (8/24/05)

  
Mooney Jones & Stokes

  
Not to Scale

Regional Traffic Distribution  
Figure 4.13-3

G:\Projects\333\Graphics\EIR\Figure 4-13-3.cdr (8/24/05)



Source: Linscott Law & Greenspan (8/24/05)

  
**Mooney Jones & Stokes**

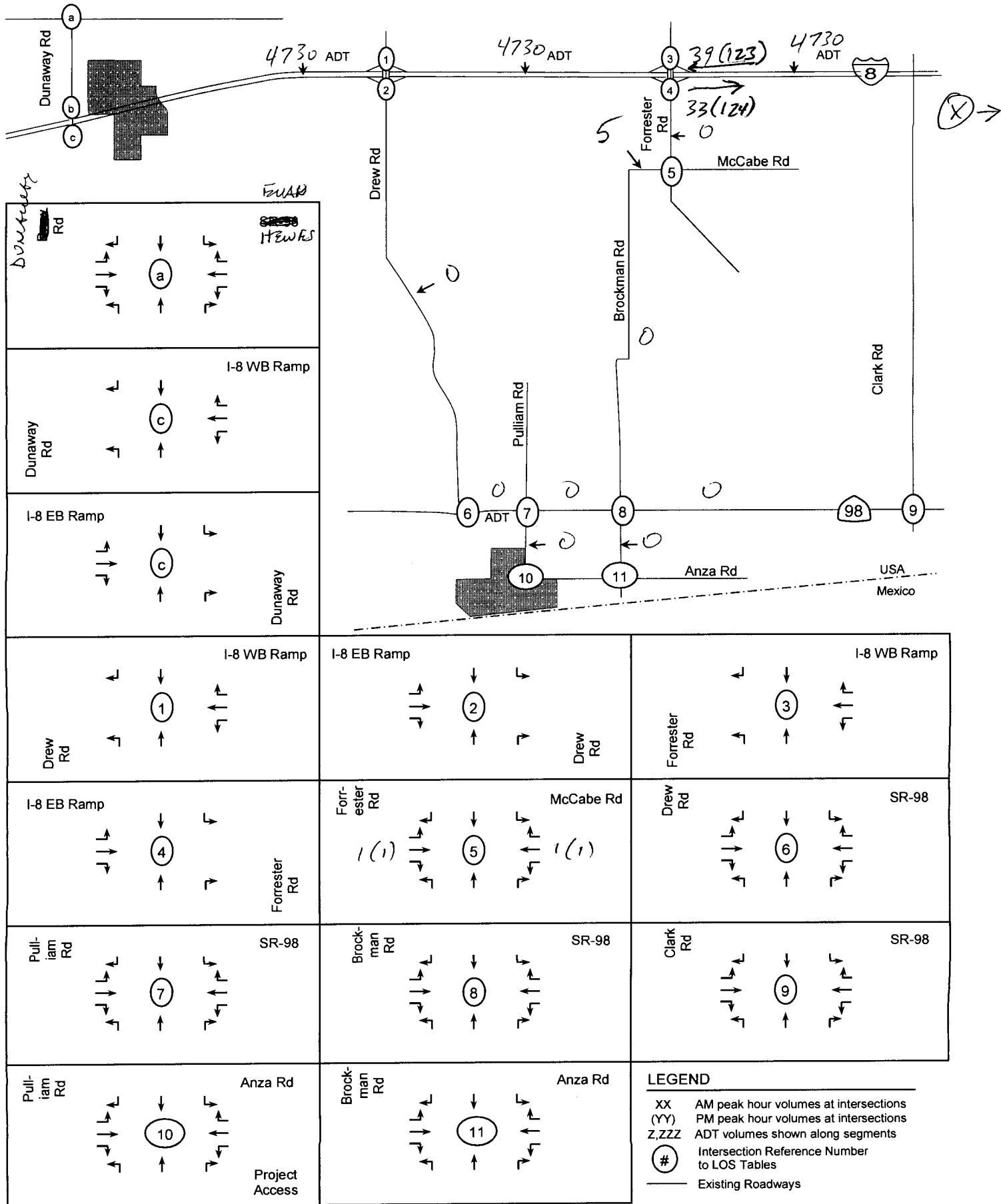
  
 Not to Scale

**Total Project Traffic Volumes  
 AM/PM Peak Hours & ADTs  
 Figure 4.13-4**

G:\Projects\333\Graphics\EIR\Figure 4-13-4.cdr (8/24/05)

# CUMULATIVE: IMPERIAL VALLEY MAIL

5



### 4.2.3 Impact Analysis

The ITE Trip Generation manual was utilized to determine the traffic generated for the project. Project trips were calculated using the fitted curve equations for each of the time periods analyzed. Table 4.2-11 shows the trip generation estimate for the project for phases I and II. The specific land use designation used for the trip generation was ITE Code 820 (Shopping Center), which best fits the description for the project. Phase II was calculated using ITE Codes 820, and 220 (Multi-family Apartments). The total project (combined Phases I & II) is calculated to generate approximately 47,300 ADT with 595 inbound/500 outbound trips during the AM peak hour and 2,165 inbound/2,275 outbound trips during the PM peak hour.

**Table 4.2-11  
Trip Generation Estimate**

Land Use	Size	ADT	AM Peak Hour					PM Peak Hour				
			% of ADT	In:Out Split	Total Trips	In	Out	% of ADT	In:Out Split	Total Trips	In	Out
Phase I												
Shopping Center	960,000	29,200	3.4	61:39	615	375	240	12.3	48:52	2,795	1,340	1,455
Phase II												
Shopping Center	500,000	15,200	2.8	61:39	320	195	125	12.0	48:52	1,455	700	755
Residential	306 DU <sup>(1)</sup>	2,900	5.5	16:84	160	25	135	6.6%	67:33	190	125	65
Phase II Total	-	18,100	-	-	480	220	260	-	-	1,645	825	1,010
Grand Total (Ph I & II)	-	47,300		-	1,095	595	500	-	-	4,440	2,165	2,275

<sup>(1)</sup> Estimated number of units based on zoning.

Source: Institute of Transportation Engineers (ITE) Trip Generation Manual, 6<sup>th</sup> Ed.

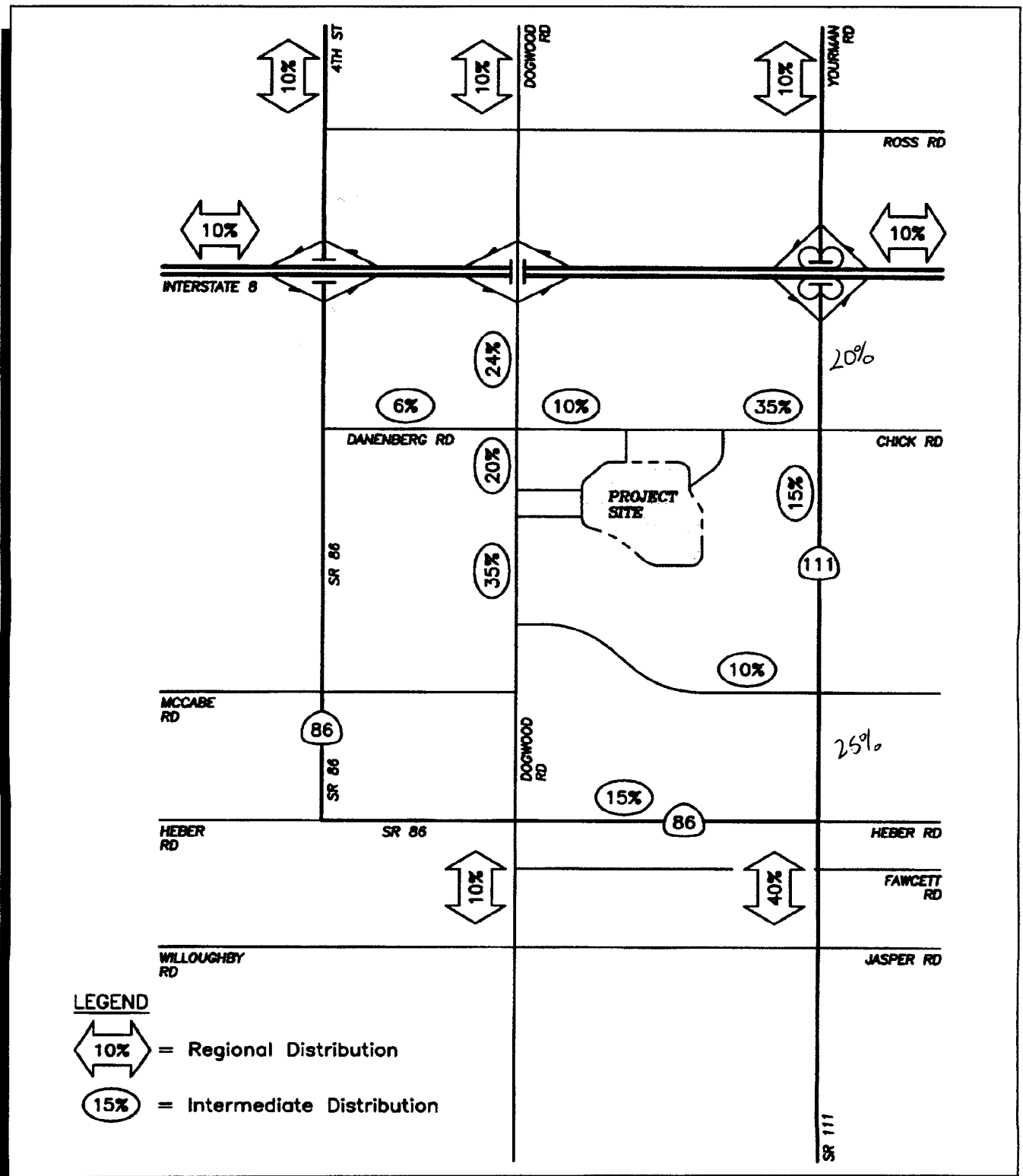
### Proposed Project – SR-111/Chick Road (Danenberg) Intersection Open

#### Project Traffic Distribution and Assignment

The generated project traffic was distributed and assigned to the street system based on the marketing strategy for the proposed project titled “*The Imperial Valley and Mexicali*”, dated October 2001 and prepared by Strategic Planning Concepts International. This document indicated that the majority of traffic would be oriented to/from the south. In addition, other factors such as project access points, the characteristics of the roadway system, and the proximity of the project to SR-111, I-8, and SR-86 were taken into consideration. Figure 4.2-4 shows Regional Traffic Distribution.

#### Intersection Analysis Results

As seen in Table 4.2-2a, Table 4.2-2b, and Figures 4.2-5 and 4.2-6 all intersections are calculated to continue to operate at LOS C or better, with the exception of the following intersections:



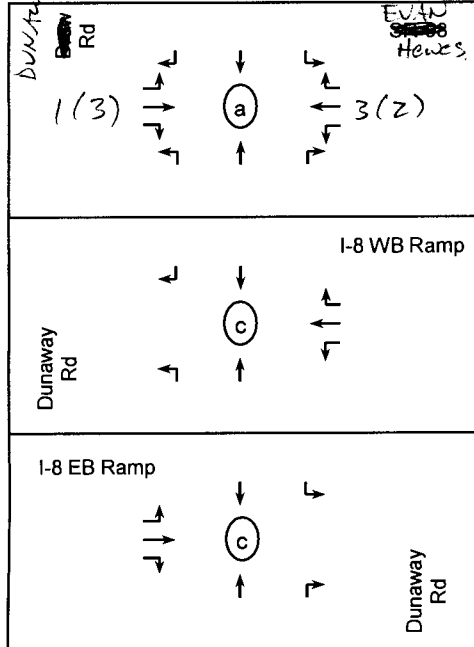
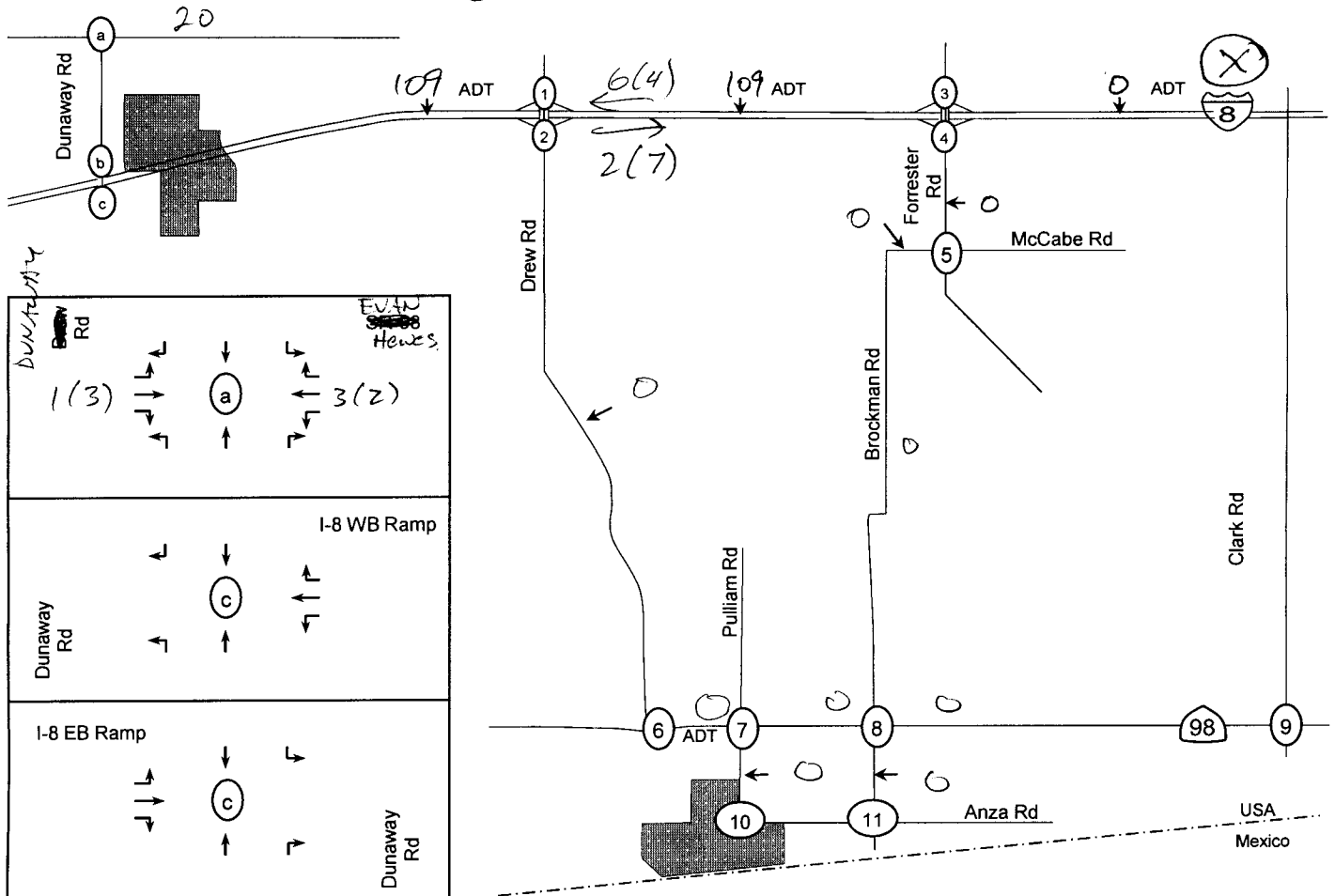
SOURCE: Linscott, Law & Greenspan



Not to Scale

## Proposed Project - SR111/Chick Road Regional Traffic Distribution

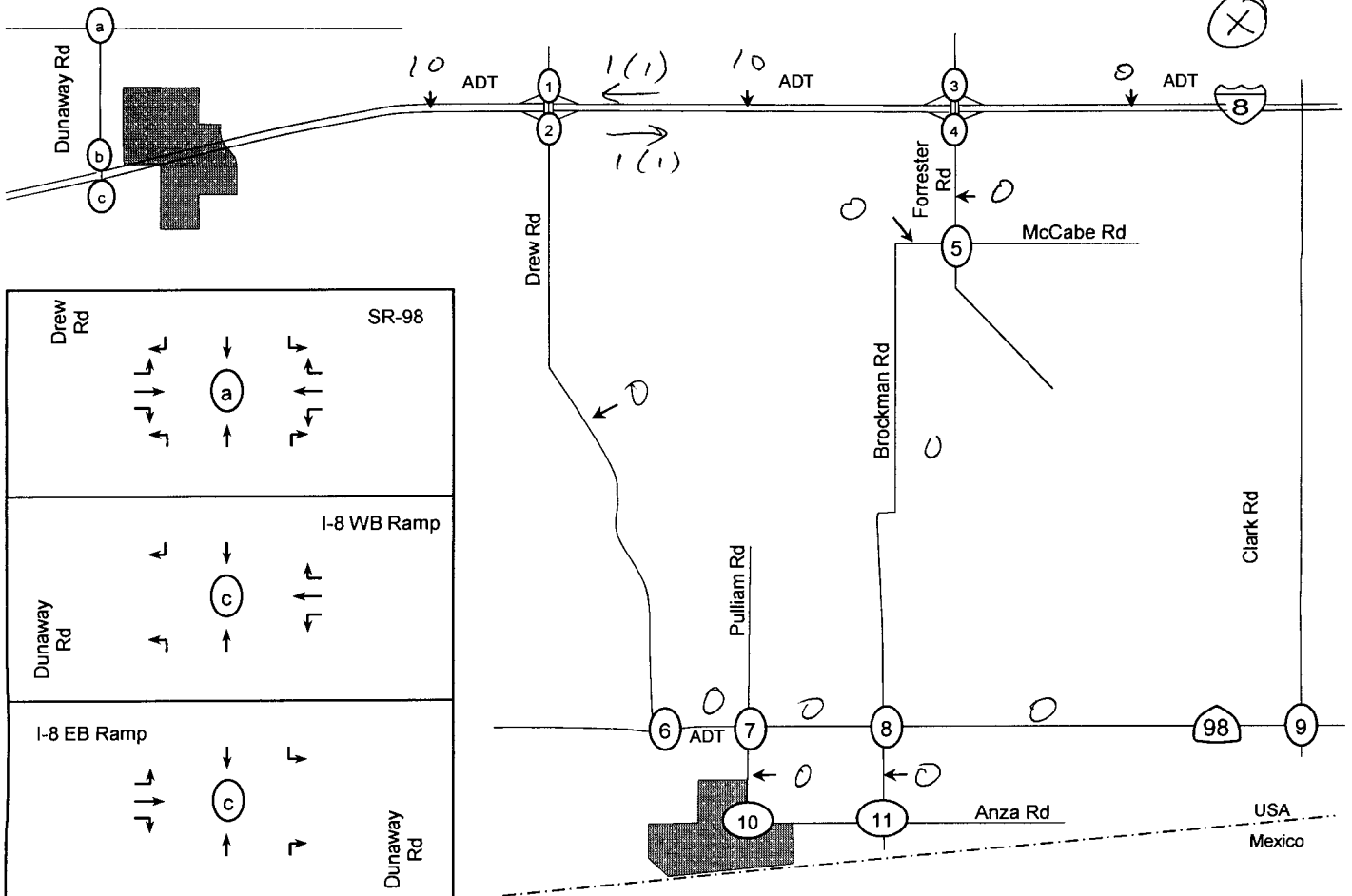
Figure 4.2-4



<p>I-8 WB Ramp Drew Rd</p>	<p>I-8 EB Ramp Drew Rd</p>	<p>I-8 WB Ramp Forrester Rd</p>
<p>I-8 EB Ramp Forrester Rd</p>	<p>McCabe Rd Forrester Rd</p>	<p>SR-98 Drew Rd</p>
<p>SR-98 Pulliam Rd</p>	<p>SR-98 Brockman Rd</p>	<p>SR-98 Clark Rd</p>
<p>Anza Rd Pulliam Rd</p>	<p>Anza Rd Brockman Rd</p>	<p><b>LEGEND</b></p> <ul style="list-style-type: none"> <li>XX AM peak hour volumes at intersections</li> <li>(YY) PM peak hour volumes at intersections</li> <li>Z,ZZZ ADT volumes shown along segments</li> <li># Intersection Reference Number to LOS Tables</li> <li>Existing Roadways</li> </ul>

# CUMULATIVE: COURTYARD VILLAS

7



Drew Rd	SR-98
Dunaway Rd	I-8 WB Ramp
I-8 EB Ramp	Dunaway Rd

Drew Rd	I-8 WB Ramp
---------	-------------

I-8 EB Ramp	Forrester Rd
-------------	--------------

Pulliam Rd	SR-98
------------	-------

Pulliam Rd	Anza Rd
	Project Access

I-8 EB Ramp	Drew Rd
-------------	---------

Forrester Rd	McCabe Rd
--------------	-----------

Brockman Rd	SR-98
-------------	-------

Brockman Rd	Anza Rd
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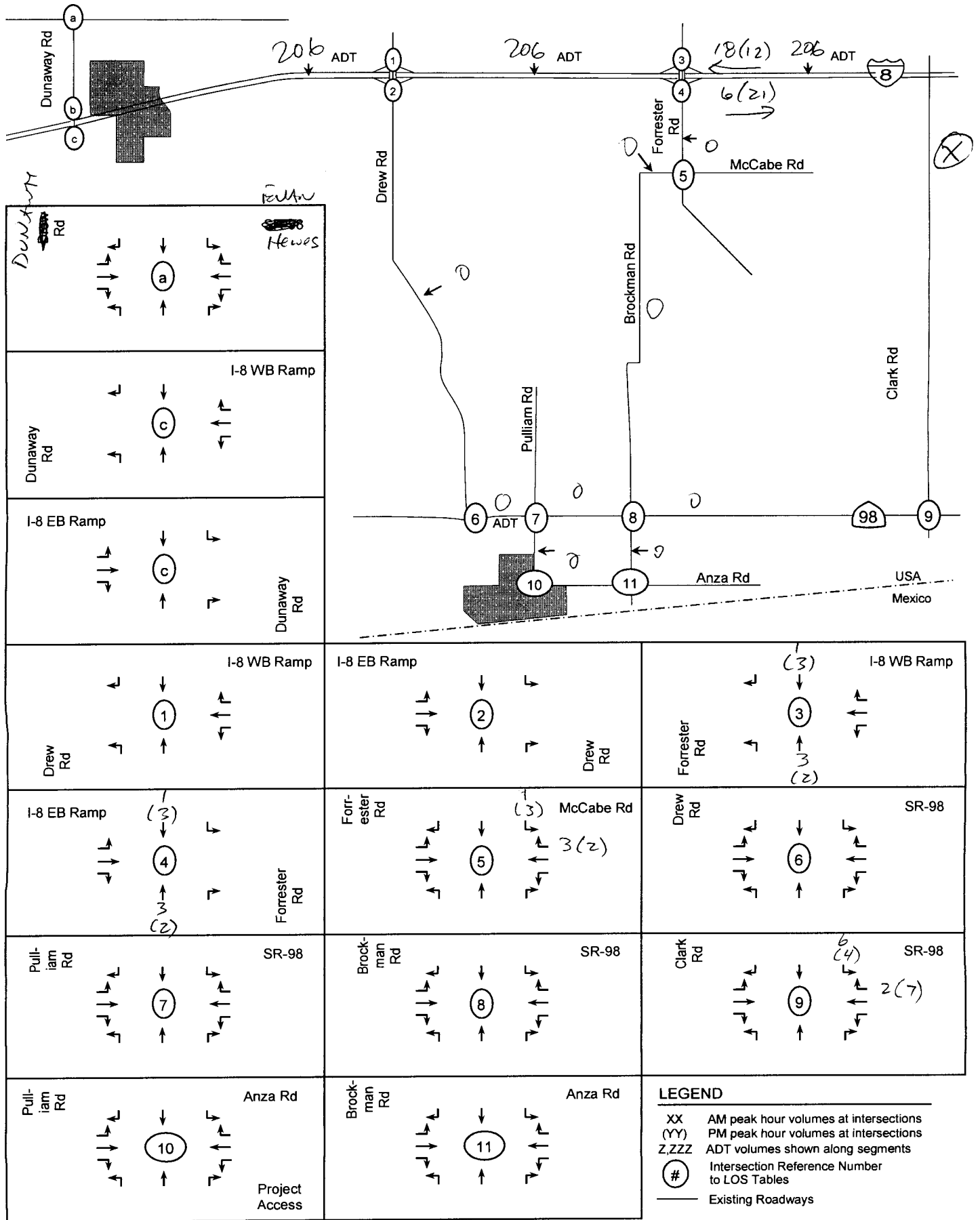
Forrester Rd	I-8 WB Ramp
--------------	-------------

Drew Rd	SR-98
---------	-------

Clark Rd	SR-98
----------	-------

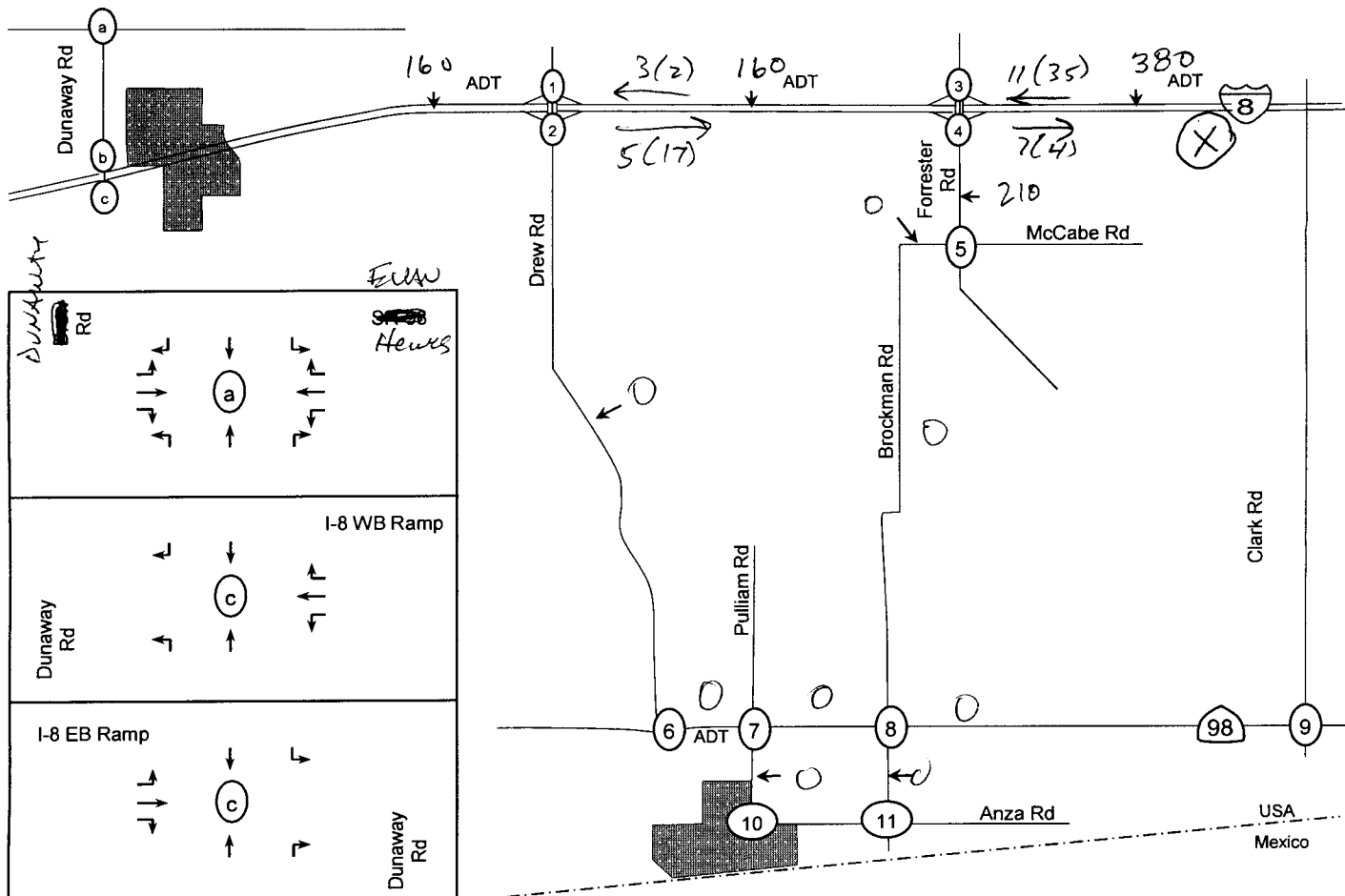
LEGEND	
XX	AM peak hour volumes at intersections
(YY)	PM peak hour volumes at intersections
Z,ZZZ	ADT volumes shown along segments
#	Intersection Reference Number to LOS Tables
—	Existing Roadways

# CUMULATIVE: WILLOW BEW (EAST & WEST) 8

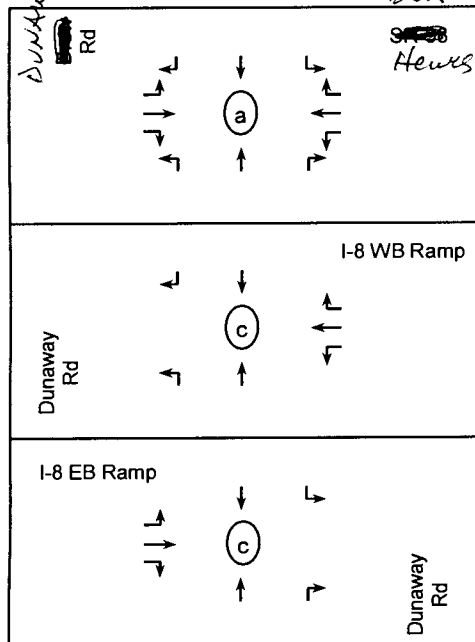


# CUMULATIVE: LOTUS RANCH

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<p>Intersection 1: Dunaway Rd and I-8 WB Ramp. Traffic flow: Dunaway Rd (left, through, right), I-8 WB Ramp (left, through, right). Lane configuration: 3 lanes each direction.</p>	<p>Intersection 2: Drew Rd and I-8 EB Ramp. Traffic flow: Drew Rd (left, through, right), I-8 EB Ramp (left, through, right). Lane configuration: 3 lanes each direction.</p>	<p>Intersection 3: Forrester Rd and I-8 WB Ramp. Traffic flow: Forrester Rd (left, through, right), I-8 WB Ramp (left, through, right). Lane configuration: 3 lanes each direction.</p>
<p>Intersection 4: I-8 EB Ramp and Forrester Rd. Traffic flow: I-8 EB Ramp (left, through, right), Forrester Rd (left, through, right). Lane configuration: 3 lanes each direction.</p>	<p>Intersection 5: Forrester Rd and McCabe Rd. Traffic flow: Forrester Rd (left, through, right), McCabe Rd (left, through, right). Lane configuration: 3 lanes each direction.</p>	<p>Intersection 6: Drew Rd and SR-98. Traffic flow: Drew Rd (left, through, right), SR-98 (left, through, right). Lane configuration: 3 lanes each direction.</p>
<p>Intersection 7: Pulliam Rd and SR-98. Traffic flow: Pulliam Rd (left, through, right), SR-98 (left, through, right). Lane configuration: 3 lanes each direction.</p>	<p>Intersection 8: Brockman Rd and SR-98. Traffic flow: Brockman Rd (left, through, right), SR-98 (left, through, right). Lane configuration: 3 lanes each direction.</p>	<p>Intersection 9: Clark Rd and SR-98. Traffic flow: Clark Rd (left, through, right), SR-98 (left, through, right). Lane configuration: 3 lanes each direction.</p>
<p>Intersection 10: Pulliam Rd and Anza Rd. Traffic flow: Pulliam Rd (left, through, right), Anza Rd (left, through, right). Lane configuration: 3 lanes each direction.</p>	<p>Intersection 11: Brockman Rd and Anza Rd. Traffic flow: Brockman Rd (left, through, right), Anza Rd (left, through, right). Lane configuration: 3 lanes each direction.</p>	<p><b>LEGEND</b></p> <ul style="list-style-type: none"> <li>XX AM peak hour volumes at intersections</li> <li>YY PM peak hour volumes at intersections</li> <li>Z,ZZZ ADT volumes shown along segments</li> <li># Intersection Reference Number to LOS Tables</li> <li>Existing Roadways</li> </ul>

Imperial Solar Energy Center WEST Traffic Study Appendix

**Imperial Plaza** consists of the proposed development of 31.88 acres into 341,516 square feet of General Commercial development. The project site is located 330 feet east of Imperial Avenue (SR 86), between the Central Drain and North 12th Street (extended). It is calculated that the proposed project will generate a total of 15,088 ADT primary trips, with 677 inbound/733 outbound trips during the PM peak hour. An application for this project has been submitted to the City and a Mitigated Negative Declaration (MND) is currently out for public review.

**Rosswood** proposes to develop 153 single-family residential dwelling units, a 69,016 square-foot park to be used by the residents of the subdivision and a 92,000 square-foot retention basin. The project is located in the southeast quadrant of Ross Avenue and the Alder Canal, north of Interstate 8, south of Ross Avenue, east of Dogwood Road, and west of SR 111 in the County of Imperial. The project requires an annexation and Change of Zone. The traffic study for this project was prepared by LLG (May 2006).

**Willowbend** proposes to develop 122 single-family residential dwelling units on 38.46 acres and a park. The project is located north of McCabe Road, east of 8<sup>th</sup> Street, and west of SR 86.

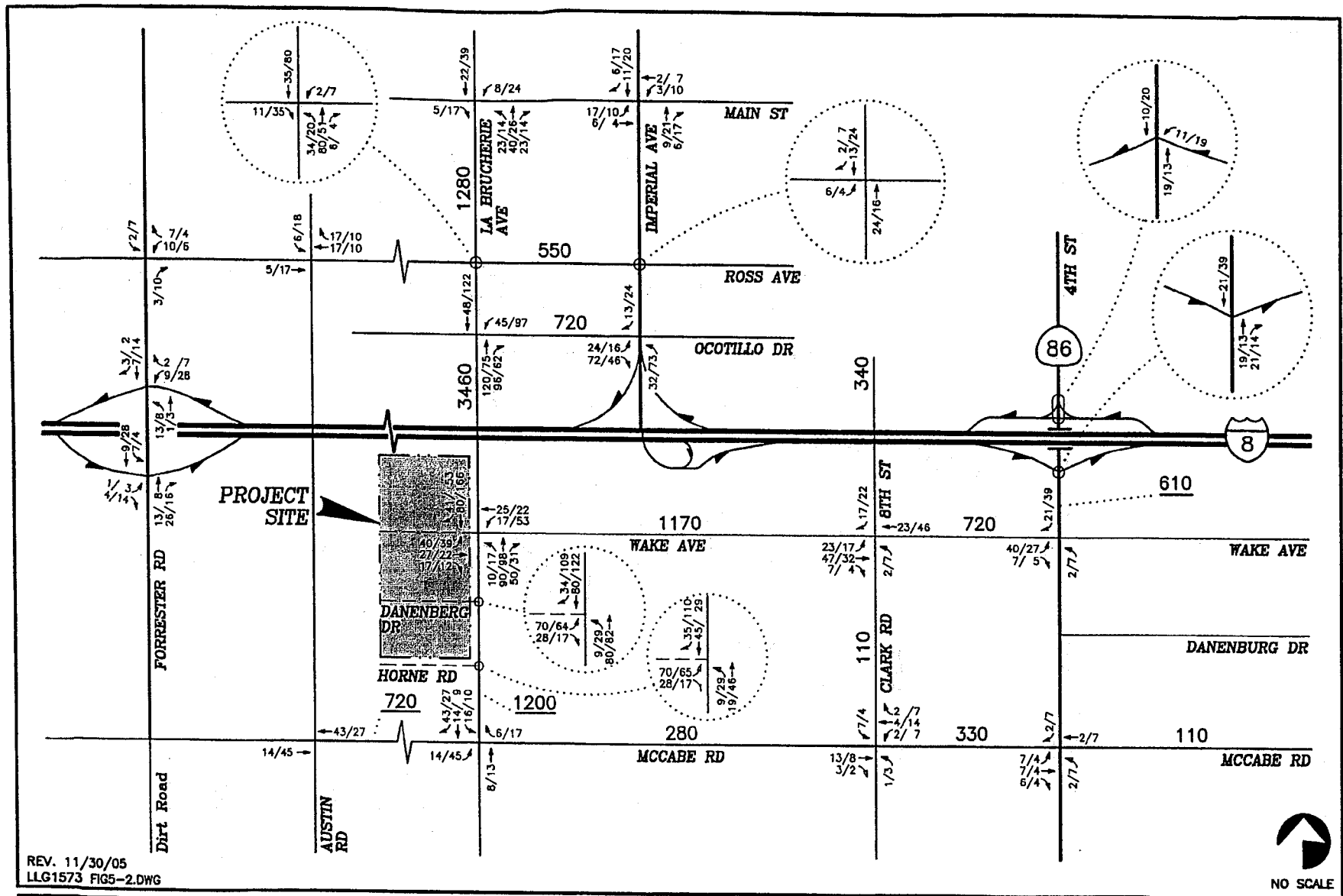
**Citrus Grove** is a proposed project involving the development of residential dwelling units on approximately 50 acres of land. The proposed project is located east of SR 86 and north of McCabe Road.

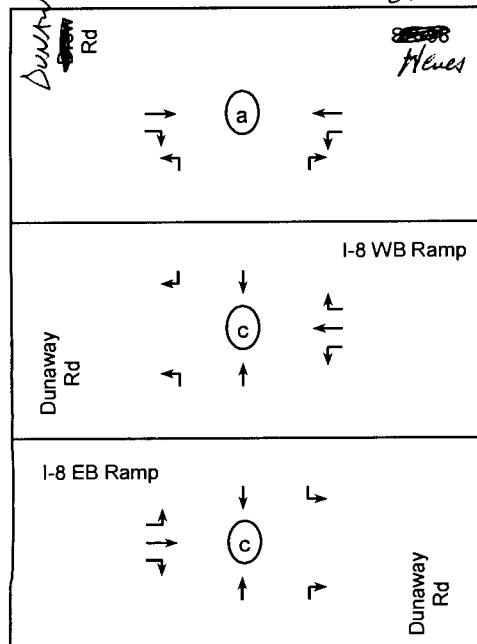
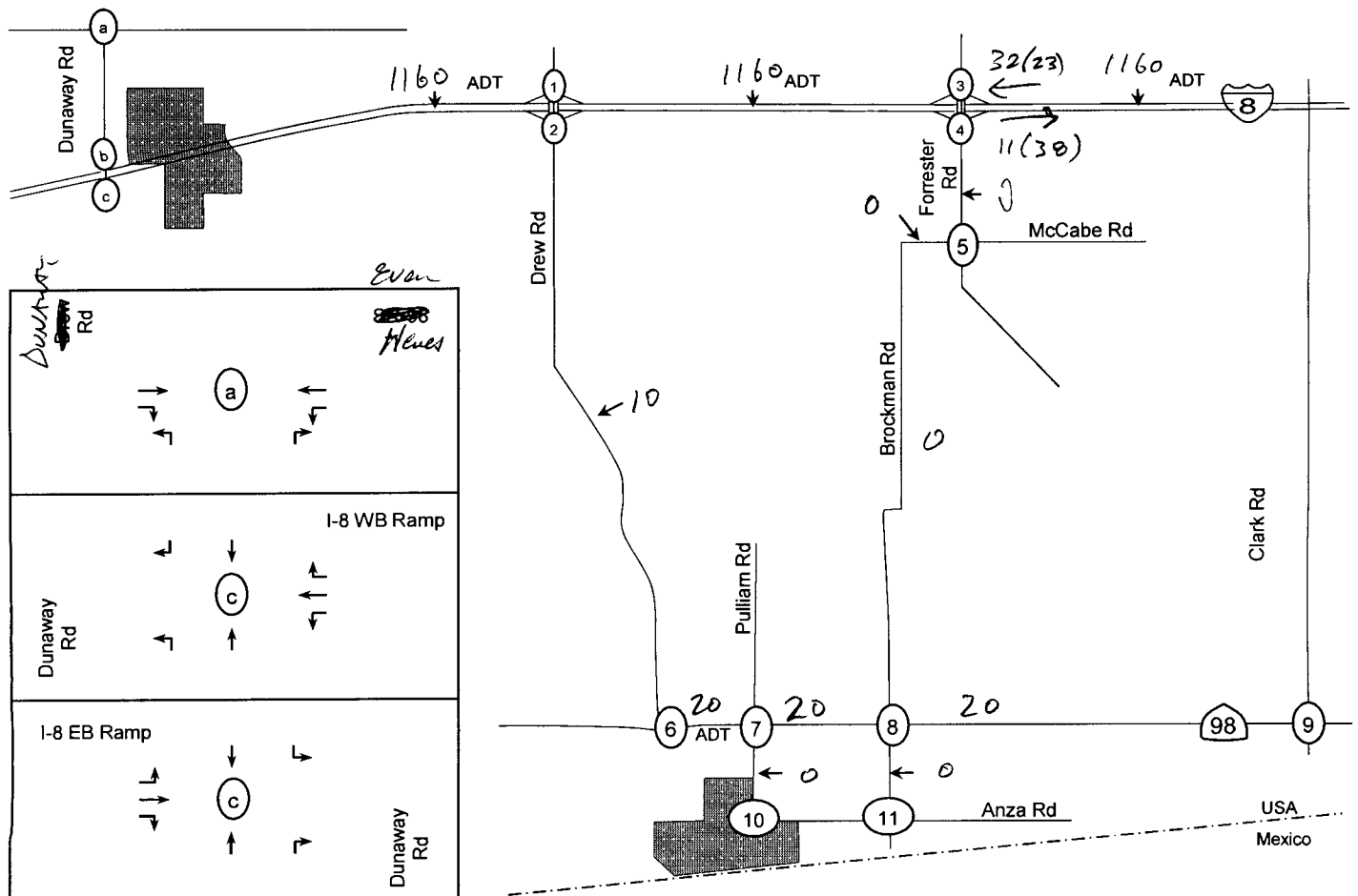
**Wake Avenue Auto Park** is an approved commercial development project covering 34.62 net acres consisting of an auto dealership, strip commercial, and an apartment complex. The site is located on the east side of Clark Road, just south of Interstate 8, in Imperial County. It is calculated that this approved project will generate 11,040 ADT with 215 inbound / 227 outbound trips during the AM peak hour and 505 inbound / 435 outbound trips during the PM peak hour. The traffic study for this project was prepared by LLG (August 2002).

**Farmer Estates** proposes to develop 190 single-family residential dwelling units. The proposed project is located south of Interstate 8 and east of La Brucherie Ave. Based on discussions with the Farmer Estates staff, the project is currently in its final phase of construction. Therefore, the trip generation was calculated based on 89 dwelling units. It is calculated that the proposed project will generate 934 ADT with 18 inbound / 61 outbound trips during the AM peak hour and 61 inbound / 36 outbound trips during the PM peak hour.

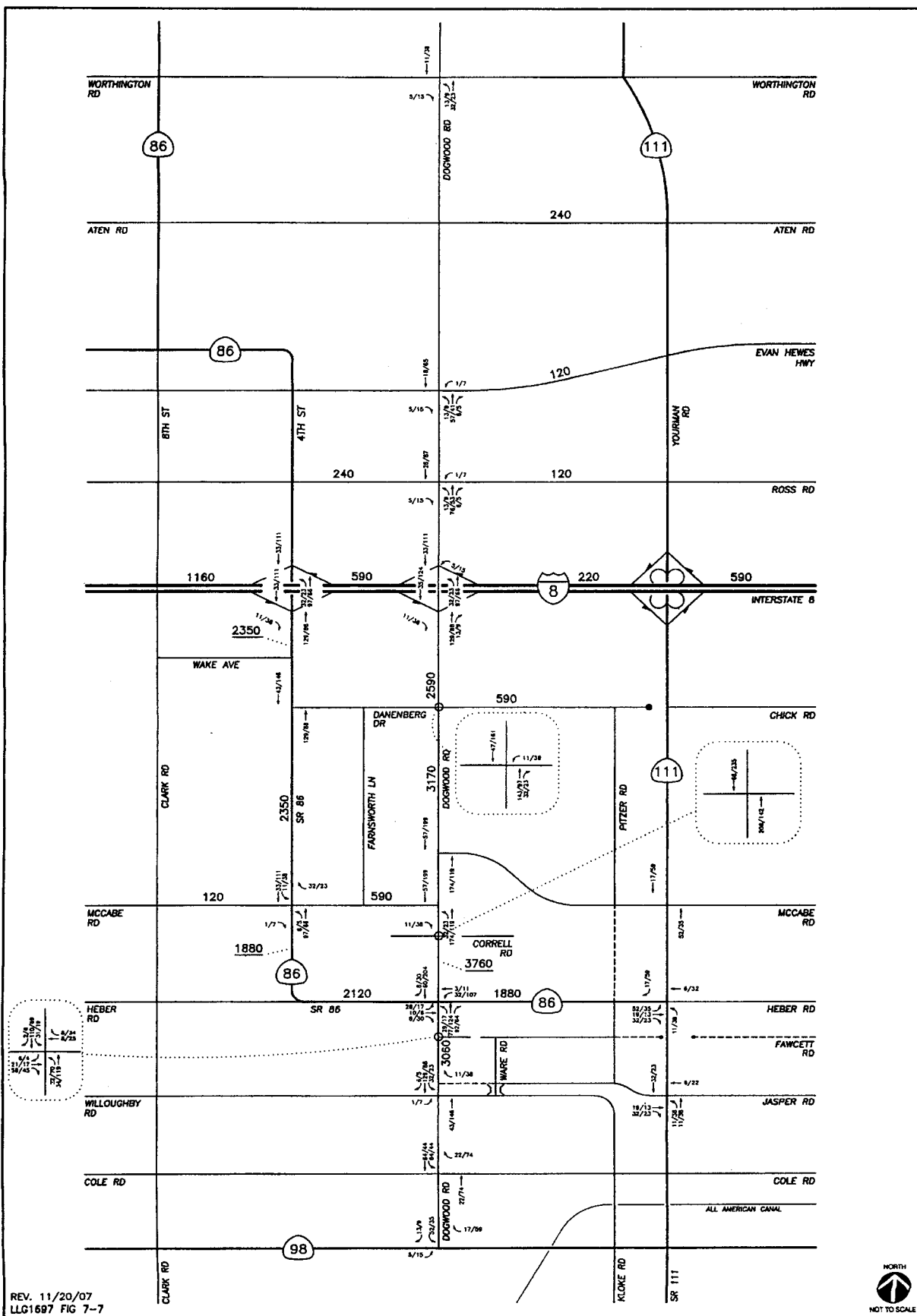
**Lotus Ranch** proposes to develop 616 single-family residential dwelling units and a 600-student elementary school. The proposed project site is located south of Interstate 8 along the west side of La Brucherie Road in the County of Imperial. The project site is proposed for annexation by the City of El Centro. The total project is calculated to generate 5,830 ADT with 163 inbound / 366 outbound trips during the AM peak hour and 369 inbound / 236 outbound trips during the PM peak hour. The traffic study for this project was prepared by LLG (May 2006).

**Miller Burson** proposes to develop 599 single-family residential dwelling units and a park site. The project is located north of Interstate 8, south of Ross Road, and east of Austin Road. The project requires an Annexation and Change of Zone.





<p>Intersection 1: Drew Rd and I-8 WB Ramp. Traffic flow and intersection reference number (1) shown.</p>	<p>Intersection 2: Drew Rd and I-8 EB Ramp. Traffic flow and intersection reference number (2) shown.</p>	<p>Intersection 3: Forrester Rd and I-8 WB Ramp. Traffic flow and intersection reference number (3) shown.</p>
<p>Intersection 4: I-8 EB Ramp and Forrester Rd. Traffic flow and intersection reference number (4) shown.</p>	<p>Intersection 5: Forrester Rd and McCabe Rd. Traffic flow and intersection reference number (5) shown.</p>	<p>Intersection 6: Drew Rd and SR-98. Traffic flow and intersection reference number (6) shown. Volumes: 0(1) and 2(1) for SR-98.</p>
<p>Intersection 7: Pulliam Rd and SR-98. Traffic flow and intersection reference number (7) shown. Volumes: 1(2) and 3(1) for SR-98.</p>	<p>Intersection 8: Brockman Rd and SR-98. Traffic flow and intersection reference number (8) shown. Volumes: 1(2) and 3(1) for SR-98.</p>	<p>Intersection 9: Clark Rd and SR-98. Traffic flow and intersection reference number (9) shown. Volumes: 5(15) and 13(9) for SR-98.</p>
<p>Intersection 10: Pulliam Rd and Anza Rd. Traffic flow and intersection reference number (10) shown.</p>	<p>Intersection 11: Brockman Rd and Anza Rd. Traffic flow and intersection reference number (11) shown.</p>	<p><b>LEGEND</b></p> <ul style="list-style-type: none"> <li>XX AM peak hour volumes at intersections</li> <li>(YY) PM peak hour volumes at intersections</li> <li>Z,ZZZ ADT volumes shown along segments</li> <li># Intersection Reference Number to LOS Tables</li> <li>Existing Roadways</li> </ul>



**TABLE 7-1  
PROJECT TRIP GENERATION**

Use	Size		Daily Trip Ends (ADTs)		% of ADT	AM Peak Hour			% of ADT	PM Peak Hour		
			Rate	Volume		In:Out Split	Volume			In:Out Split	Volume	
							In	Out			In	Out
Phase I												
Single-Family Residential	182	DU	a	1,800	b	25:75	34	103	c	63:37	116	68
Multi-Family Residential	42	DU	d	310	e	17:83	4	22	f	67:33	20	10
Subtotal Phase I				2,110	—	—	38	125	—	—	136	78
Phase II												
Single-Family Residential	206	DU	a	2,020	b	25:75	39	115	c	63:37	129	76
Multi-Family Residential	102	DU	d	650	e	17:83	9	43	f	67:33	41	20
Subtotal Phase II				2,670	—	—	48	158	—	—	170	96
Phase III												
Single-Family Residential	199	DU	a	1,960	b	25:75	37	112	c	63:37	125	74
Subtotal Phase III				1,960	—	—	37	112	—	—	125	74
Phase IV												
Single-Family Residential	193	DU	a	1,900	b	25:75	36	109	c	63:37	122	71
Multi-Family Residential	44	DU	d	320	e	17:83	5	22	f	67:33	20	11
Commercial (Specialty Retail)	2.7	Acres	400/ Acre	1,080	3%	60:40	19	13	9%	50:50	49	49
5% Mixed-Use Reduction				-165			-3	-7			-10	-7
Subtotal Phase IV				3,135	—	—	57	137	—	—	181	124
Phase V												
Single-Family Residential	128	DU	a	1,310	b	25:75	24	75	c	63:37	85	49
Multi-Family Residential	58	DU	d	400	e	17:83	6	28	f	67:33	26	13
Continues next page...												

Table 7-1 Cont... Project Trip Generation									
<b>Subtotal Phase V</b>	<b>1,710</b>	<b>—</b>	<b>—</b>	<b>30</b>	<b>103</b>	<b>—</b>	<b>—</b>	<b>111</b>	<b>62</b>
<b>Total Project ( Phases I, II, III, IV &amp; V)</b>	<b>11,585</b>	<b>—</b>	<b>—</b>	<b>210</b>	<b>635</b>	<b>—</b>	<b>—</b>	<b>723</b>	<b>434</b>

**Footnotes:**

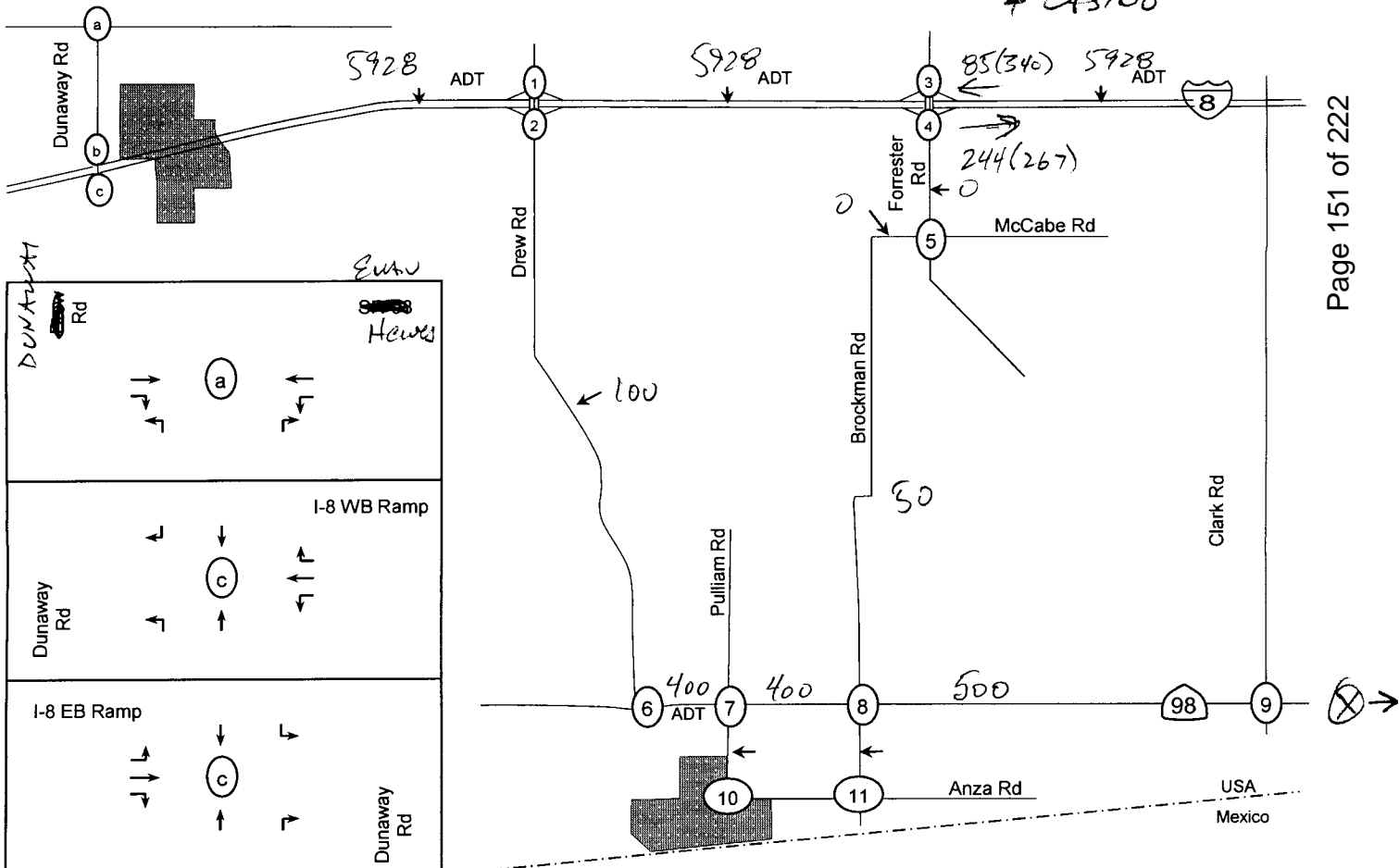
- a. Single-Family Detached Housing Rate:  $\text{Ln}(T)=0.92\text{Ln}(X) + 2.71$
- b. AM Peak:  $T=0.70(X) + 9.43$
- c. PM Peak:  $\text{Ln}(T)=0.90\text{Ln}(X) + 0.53$
- d. Residential Condominium/Townhouse Rate:  $\text{Ln}(T)=0.85\text{Ln}(X) + 2.55$
- e. AM Peak:  $\text{Ln}(T)=0.80\text{Ln}(X) + 0.26$
- f. PM Peak:  $\text{Ln}(T)=0.82\text{Ln}(X) + 0.32$

**General Notes:**

- 1. Rates are based on ITE Trip Generation Manual, 7<sup>th</sup> Edition.
- 2. The commercial rate is based on SANDAG's Trip Generation rates: Specialty Retail

# CUMULATIVE: HALLWOOD/CALEXICO PALACE III & CASINO

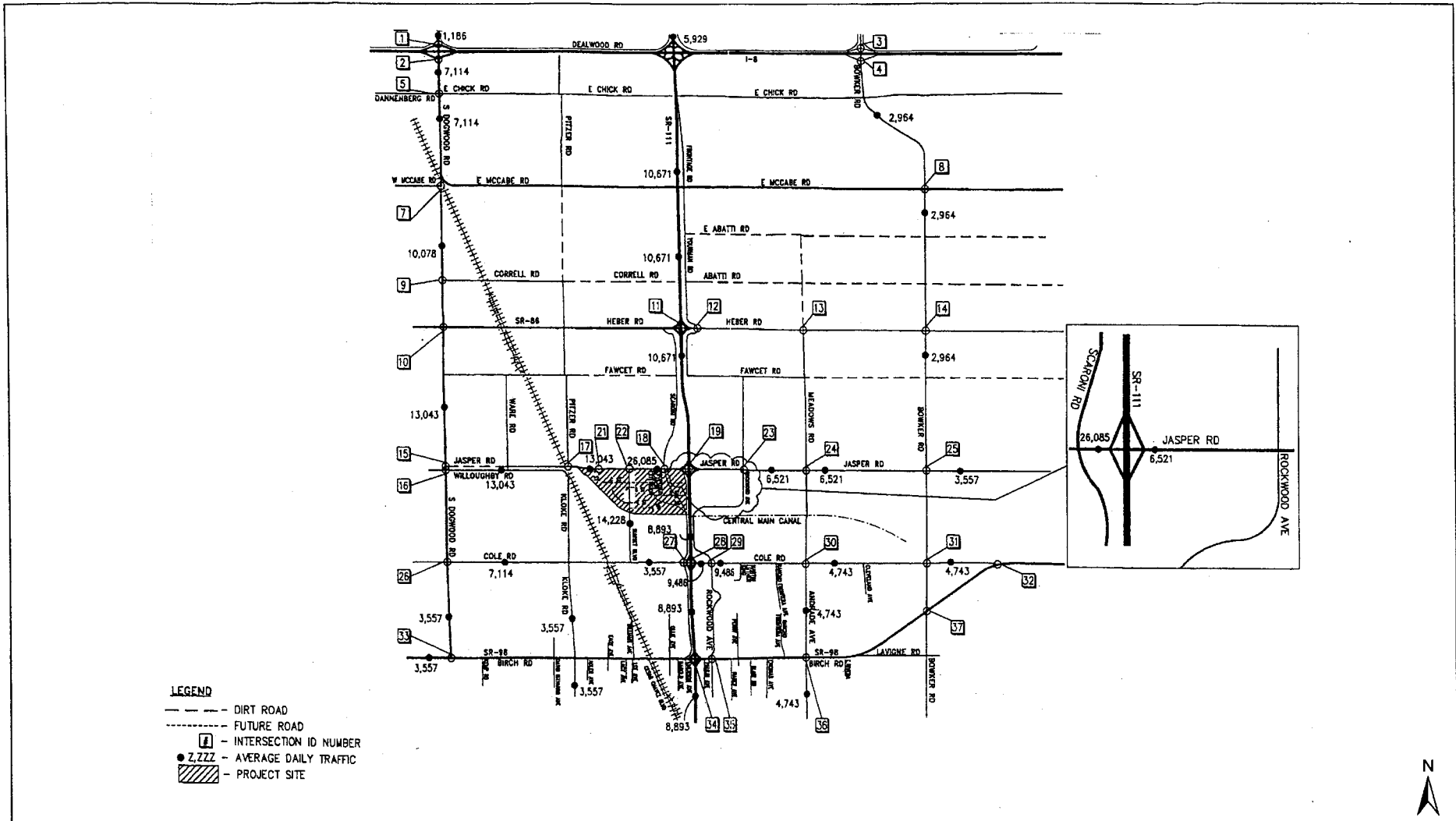
11



<p>Dunaway Rd</p> <p>Inter- section a</p>	<p>Drew Rd</p> <p>Inter- section 1</p>	<p>Forrester Rd</p> <p>Inter- section 3</p>
<p>Dunaway Rd</p> <p>Inter- section c</p>	<p>Drew Rd</p> <p>Inter- section 2</p>	<p>Forrester Rd</p> <p>Inter- section 4</p>
<p>I-8 EB Ramp</p> <p>Inter- section c</p>	<p>Drew Rd</p> <p>Inter- section 6</p>	<p>Forrester Rd</p> <p>Inter- section 5</p>
<p>I-8 WB Ramp</p> <p>Inter- section 1</p>	<p>Drew Rd</p> <p>Inter- section 7</p>	<p>Forrester Rd</p> <p>Inter- section 8</p>
<p>I-8 EB Ramp</p> <p>Inter- section 4</p>	<p>Forrester Rd</p> <p>Inter- section 5</p>	<p>Drew Rd</p> <p>Inter- section 6</p>
<p>Pulliam Rd</p> <p>Inter- section 7</p>	<p>Brockman Rd</p> <p>Inter- section 8</p>	<p>Clark Rd</p> <p>Inter- section 9</p>
<p>Pulliam Rd</p> <p>Inter- section 10</p>	<p>Brockman Rd</p> <p>Inter- section 11</p>	<p>Clark Rd</p> <p>Inter- section 10</p>

## LEGEND

- XX AM peak hour volumes at intersections
- (YY) PM peak hour volumes at intersections
- Z,ZZZ ADT volumes shown along segments
- # Intersection Reference Number to LOS Tables
- Existing Roadways



SOURCE: Darnell & Associates, Inc., 2008

9/2/08

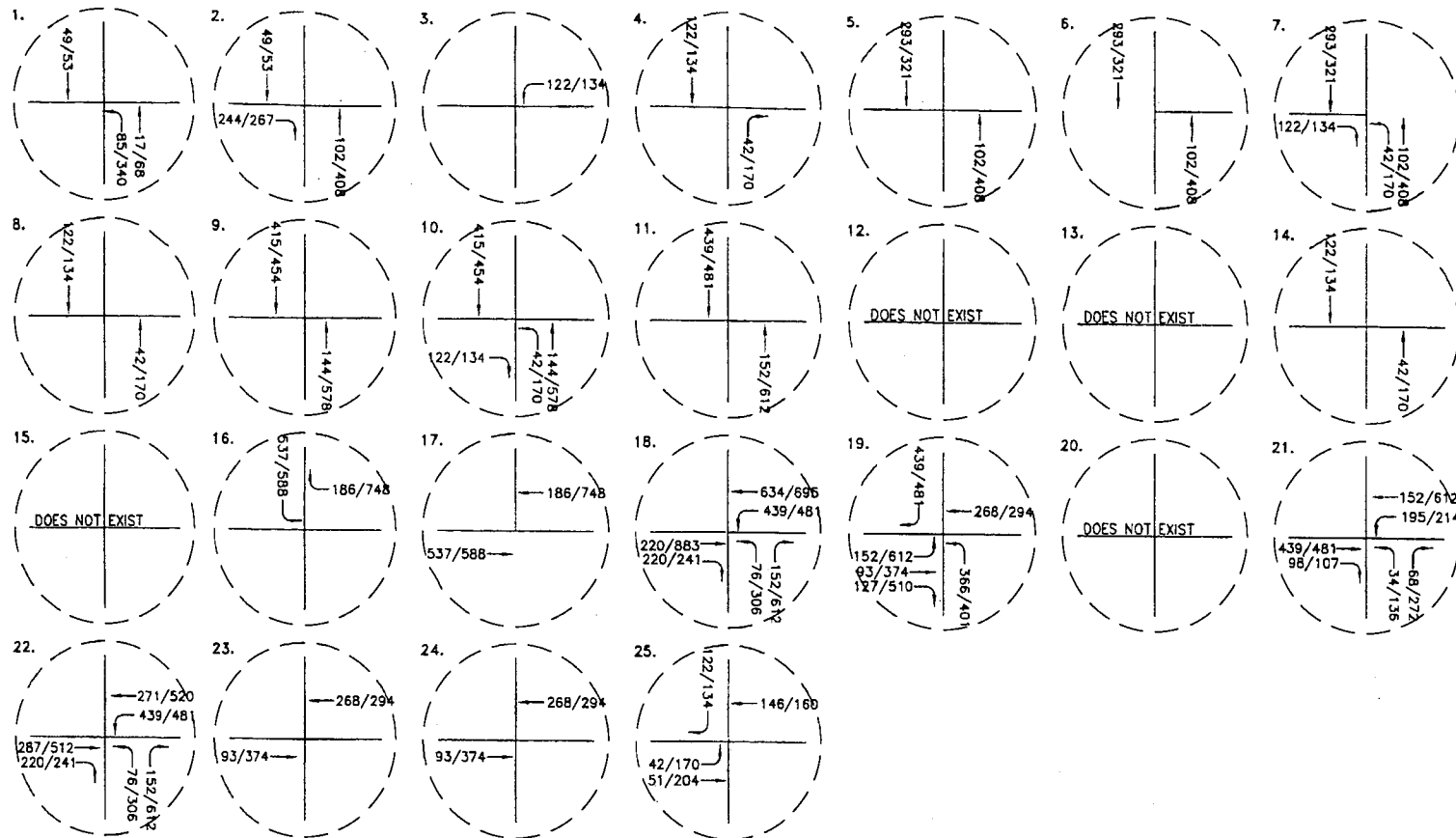
111 Calexico Place Specific Plan EIR

2015 (All Phases) Project Daily Traffic Volumes

FIGURE  
4.3-14

F:\projects\634 Calexico\2nd Screencheck Draft EIR\Chapter 4\Figure 4.3-14 2015 (All Phases) Project Daily Traffic Volumes.dwg

4.3-47



**LEGEND**  
 XX/YY - AM/PM PEAK HOUR TURN VOLUMES.  
 ——— DIRECTION OF TRAVEL  
 \* VOLUMES USED FOR YEAR 2015 CONDITIONS.



SOURCE: Darnell & Associates, Inc., 2008

9/2/08

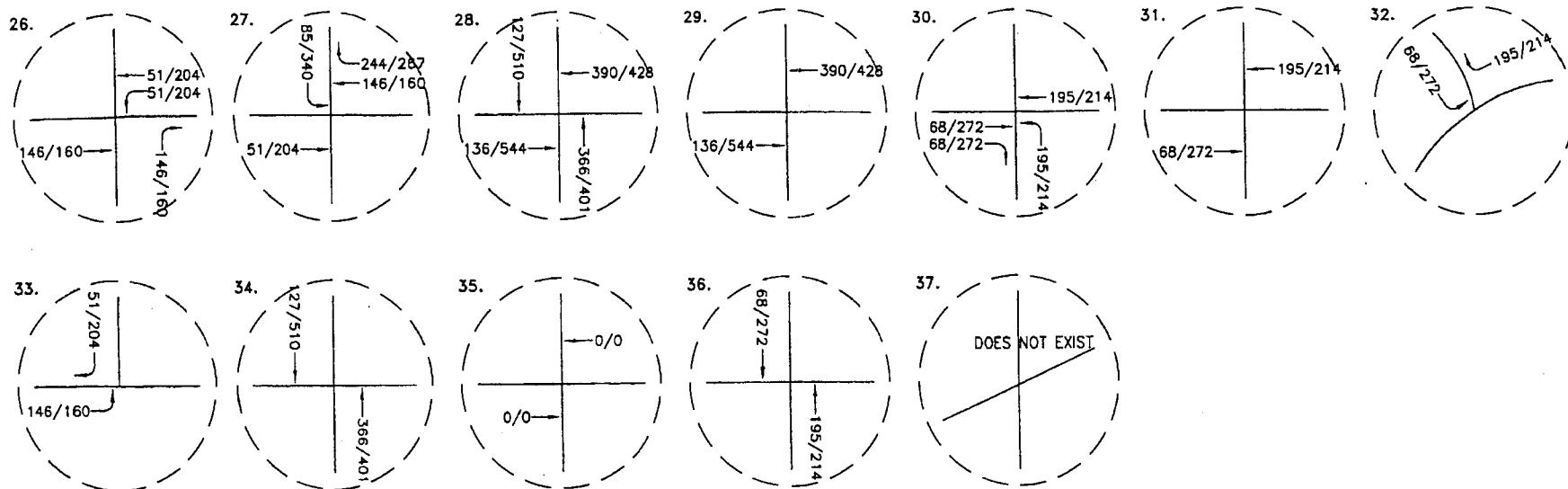


111 Calexico Place Specific Plan EIR

2015 (All Phases) Project Intersection Traffic Volumes - North

**FIGURE**  
**4.3-15**

F:\projects\A34 Calexico\2nd Screencheck Draft EIR\Chapter 4\Figure 4.3-15 2015 (All Phases) Project Intersection Traffic Volumes North.dwg  
 4.3-49



**LEGEND**

XX/YY - AM/PM PEAK HOUR TURN VOLUMES

— - DIRECTION OF TRAVEL

\* VOLUMES USED FOR YEAR 2015 CONDITIONS.



SOURCE: Darnell & Associates, Inc., 2008

9/2/08



111 Calexico Place Specific Plan EIR

2015 (All Phases) Project Intersection Traffic Volumes - South

FIGURE  
4.3-16

F:\projects\434 Calexico\2nd Screencheck Draft EIR\Chapter 4\Figure 4.3-16 2015 (All Phases) Project Intersection Traffic Volumes South of 4.3-51

TABLE 4.3-7  
Trip Generation Summary – Total Project  
(All Phases) – with Internal/Pass-by Applied

Trip Generation Rates										
Phase	Land Use	External Traffic <sup>(a)</sup>	Daily	AM Peak Hour			PM Peak Hour			
				% of Daily	% In	% Out	% of Daily	% In	% Out	
Total Project (All Phases)	Retail	78	80	4	60	40	10	50	50	
	Restaurant w/Drive Thru	51	650	7	50	50	7	50	50	
	Restaurant-Quality	51	100	1	60	40	8	70	30	
	Casino	100	100	1	90	10	6.77	3.95	2.82	
	Hotel (Casino)	58	8	5	60	40	7	40	60	
	Hotel	98	8	5	60	40	7	40	60	
	Office	100	20	14	90	10	13	20	80	
	Office Tech	100	16	12	80	20	12	20	80	
Primary Trip Generation Calculations										
Phase	Land Use	Density	Unit	Daily	AM Peak Hour			PM Peak Hour		
					Total	In	Out	Total	In	Out
Total Project (All Phases)	Retail	411.00	KSF	25,646	1,026	616	410	2,302	1,151	1,151
	Restaurant w/Drive Thru	10.00	KSF	3,315	232	116	116	751	376	376
	Restaurant-Quality	100.00	KSF	5,100	51	31	20	528	370	158
	Casino	93.88	KSF	9,388	94	84	9	636	371	265
	Hotel (Casino)	200.00	Rooms	928	46	28	19	65	26	39
	Hotel	200.00	Rooms	1,568	78	47	31	110	44	66
	Office	395.00	KSF	7,900	1,106	995	111	1,027	205	822
	Office Tech	340.00	KSF	5,440	653	522	131	653	131	522
TOTAL PRIMARY TRAFFIC				59,285	3,286	2,439	847	6,071	2,673	3,398

Notes: (a) = External traffic based on pass-by rates

KSF = Thousand Square Feet

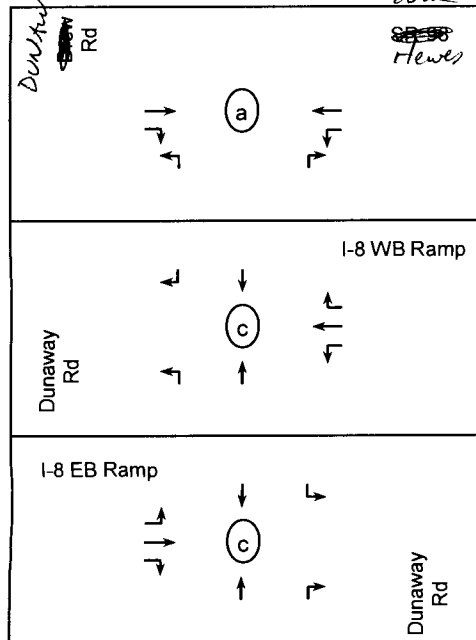
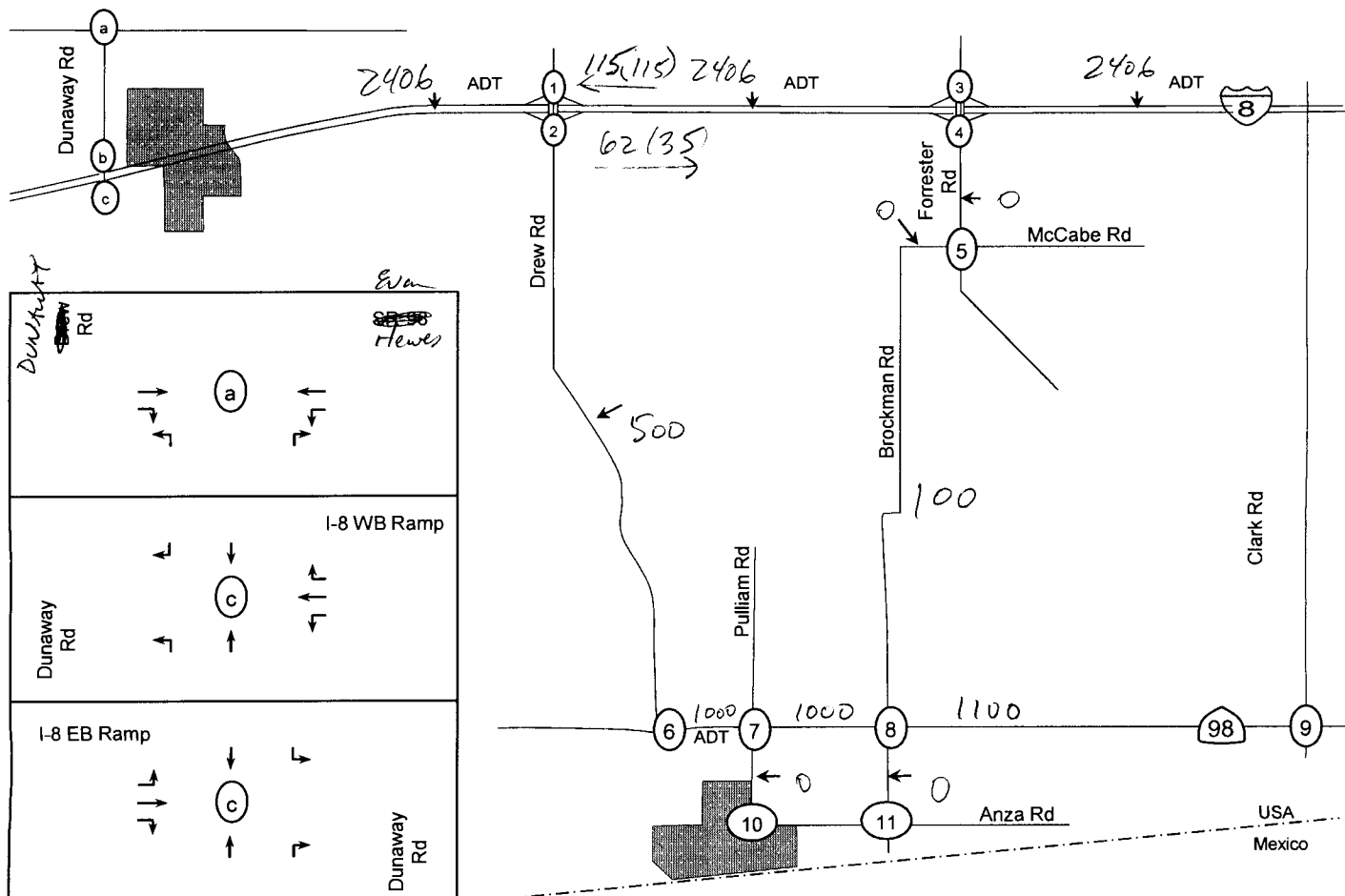
Source: Darnell & Associates, Inc., 2008

**TABLE 4.3-6**  
**Trip Generation Summary – Total Project**  
**(All Phases)**

Trip Generation Rates										
Phase	Land Use	Daily	AM Peak Hour			PM Peak Hour				
			% of Daily	% In	% Out	% of Daily	% In	% Out		
Total Project (All Phases)	Retail	80	4	60	40	10	50	50		
	Restaurant w/Drive Thru	650	7	50	50	7	50	50		
	Restaurant-Quality	100	1	60	40	8	70	30		
	Casino	100	1	90	10	6.77	3.95	2.82		
	Hotel (Casino)	8	5	60	40	7	40	60		
	Hotel	8	5	60	40	7	40	60		
	Office	20	14	90	10	13	20	80		
	Office Tech	16	12	80	20	12	20	80		
Trip Generation Calculations										
Phase	Land Use	Density	Unit	Daily	AM Peak Hour			PM Peak Hour		
					Total	In	Out	Total	In	Out
Total Project (All Phases)	Retail	411.00	KSF	32,880	1,315	789	526	3,288	1,644	1,644
	Restaurant w/Drive Thru	10.00	KSF	6,500	455	228	228	455	228	228
	Restaurant-Quality	100.00	KSF	10,000	100	60	40	800	560	240
	Casino	93.88	KSF	9,388	94	84	9	636	371	265
	Hotel (Casino)	200.00	Rooms	1,600	80	48	32	112	45	67
	Hotel	200.00	Rooms	1,600	80	48	32	112	45	67
	Office	395.00	KSF	7,900	1,106	995	111	1,027	205	822
	Office Tech	340.00	KSF	5,440	653	522	131	653	131	522
TOTAL ON-SITE TRAFFIC				75,308	3,883	2,775	1,108	7,082	3,228	3,854

Notes: KSF = Thousand Square Feet

Source: Darnell &amp; Associates, Inc., 2008



		<p><b>LEGEND</b></p> <p>XX AM peak hour volumes at intersections</p> <p>(YY) PM peak hour volumes at intersections</p> <p>Z,ZZZ ADT volumes shown along segments</p> <p># Intersection Reference Number to LOS Tables</p> <p>Existing Roadways</p>

**TABLE 3.15-8  
TRIP GENERATION SUMMARY (YEAR 2015)**

Phase	Land Use	Trip Generation Rates								
		Daily	AM Peak Hour			PM Peak Hour				
			% of Daily	% In	% Out	% of Daily	% In	% Out		
With Internal Capture Applied										
Phase	Land Use	Density	External Traffic	Trip Generation Calculations						
				Daily	AM Peak Hour			PM Peak Hour		
					Total	In	Out	Total	In	Out
Commercial Phases 1-4	Community Shopping Center	452.610	78%	28,243	1,130	678	452	2,824	1,412	1,412
Business Park Phases 1-3	Regional Shopping (acres)	44.700	89%	19,892	796	557	239	1,790	895	895
Total (Year 2015)				48,134	1,925	1,235	691	4,615	2,307	2,307

ksf = thousand square feet.

SOURCE: Darnell &amp; Associates, 2008.

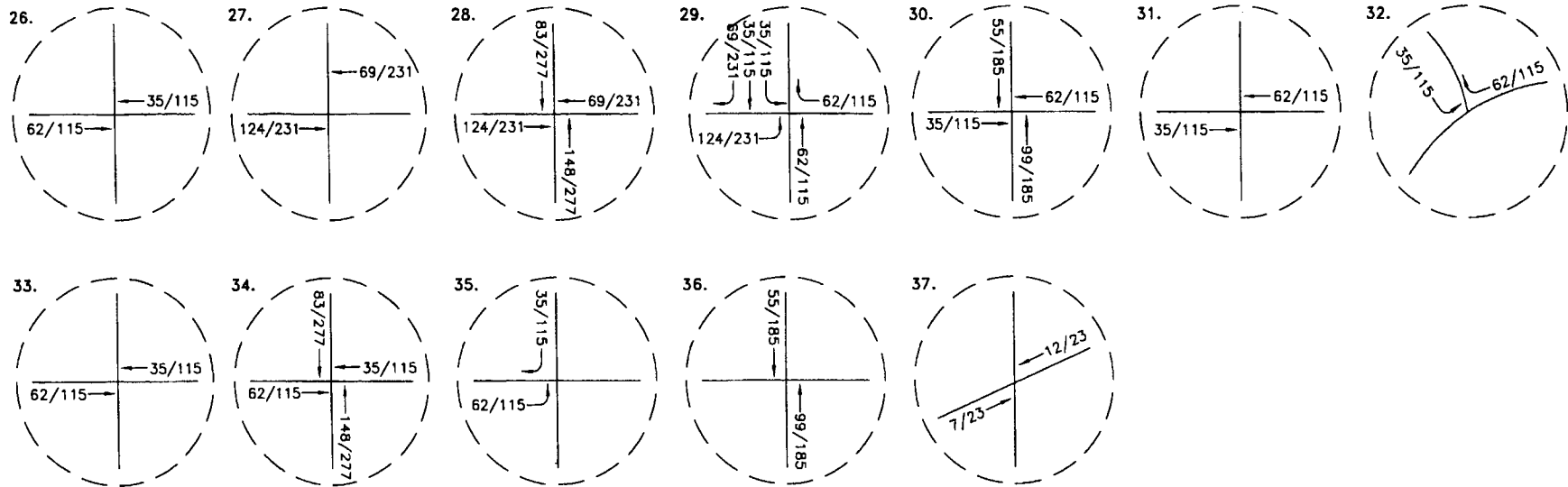
**TABLE 3.15-9  
TRIP GENERATION SUMMARY (YEAR 2017) – TOTAL PROJECT WITH INTERNAL REDUCTION**

Phase				Land Use				Trip Generation Rates														
								AM Peak Hour				PM Peak Hour										
								Daily	% of Daily	% In	% Out	% of Daily	% In	% Out								
Commercial Phases 1-4		Community Shopping Center (78 percent external)		62.4	4	60	40	10	50	50												
Business Park Phases 1-4		Regional Shopping (acres) (89 percent external)		445	4	70	30	9	50	50												
Total Trip Generation																						
Phase				Land Use				Density				Unit				Trip Generation Calculations						
																AM Peak Hour				PM Peak Hour		
																Daily	Total	In	Out	Total	In	Out
Commercial Phases 1-4		Community Shopping Center		452.610	ksf	28,243	1,130	678	452	2,824	1,412	1,412										
Business Park Phases 1-4		Regional Shopping (acres)		51.900	acres	23,096	924	647	277	2,079	1,039	1,039										
Total Project						51,338	2,054	1,325	729	4,903	2,451	2,451										

ksf = thousand square feet.

SOURCE: Darnell &amp; Associates, 2009.





**LEGEND**

XX/YY - AM/PM PEAK HOUR TURN VOLUMES  
→ - DIRECTION OF TRAVEL

SEE FIGURE 13 FOR INTERSECTION LOCATION

**Darnell & ASSOCIATES, INC.**

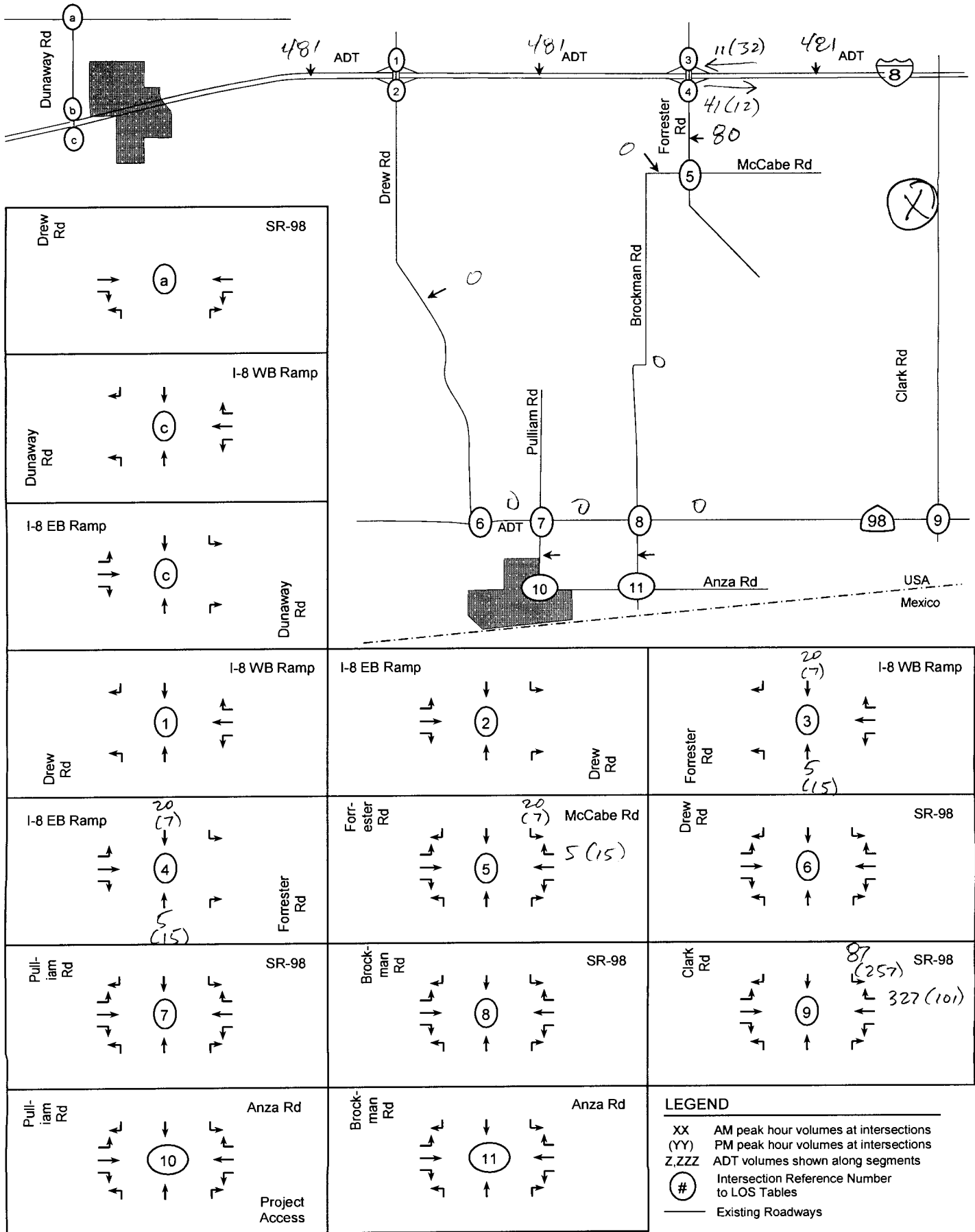
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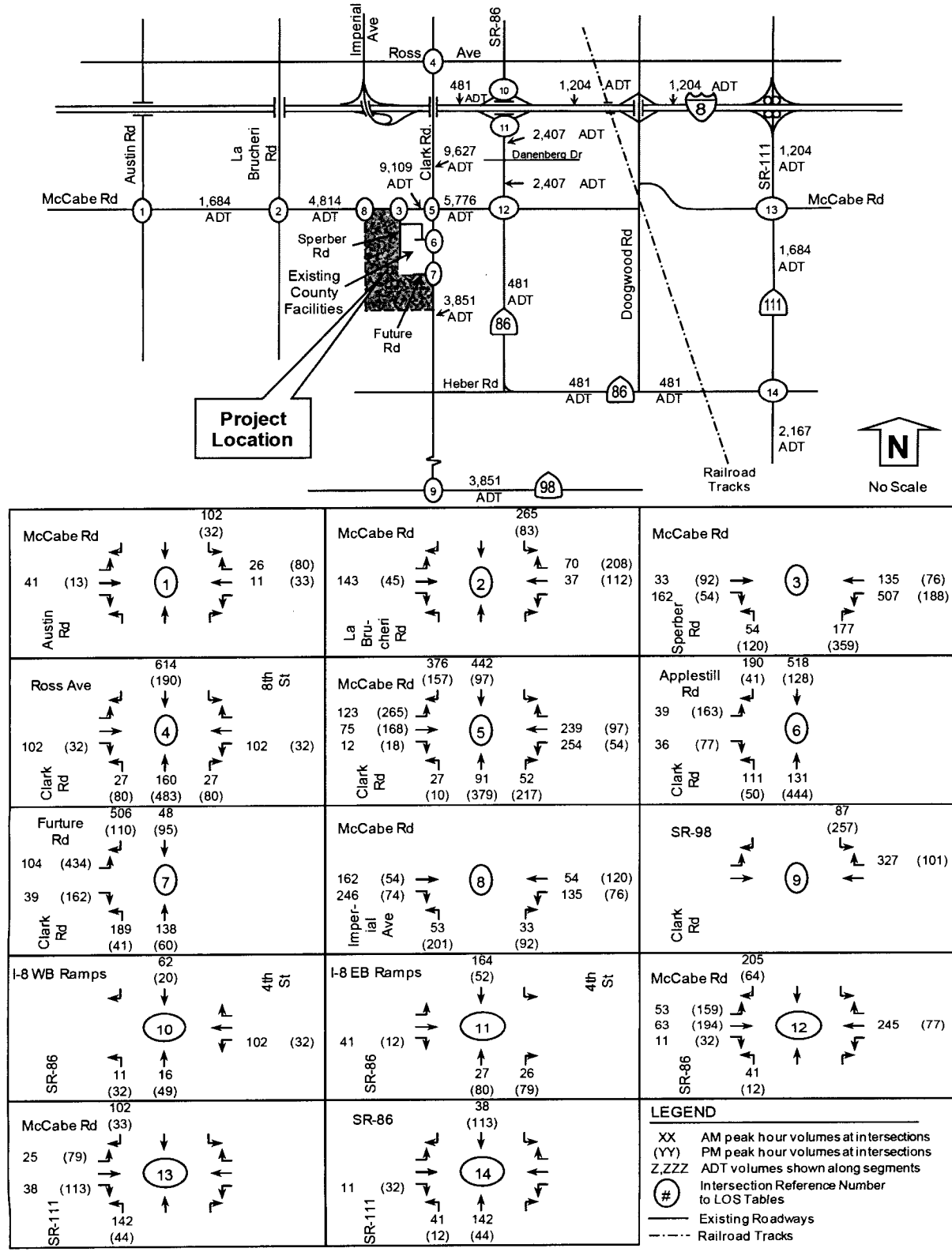
SN/CDJ

**FIGURE 15**

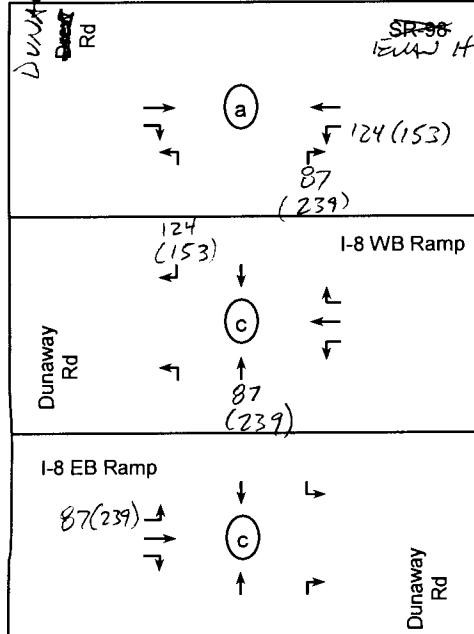
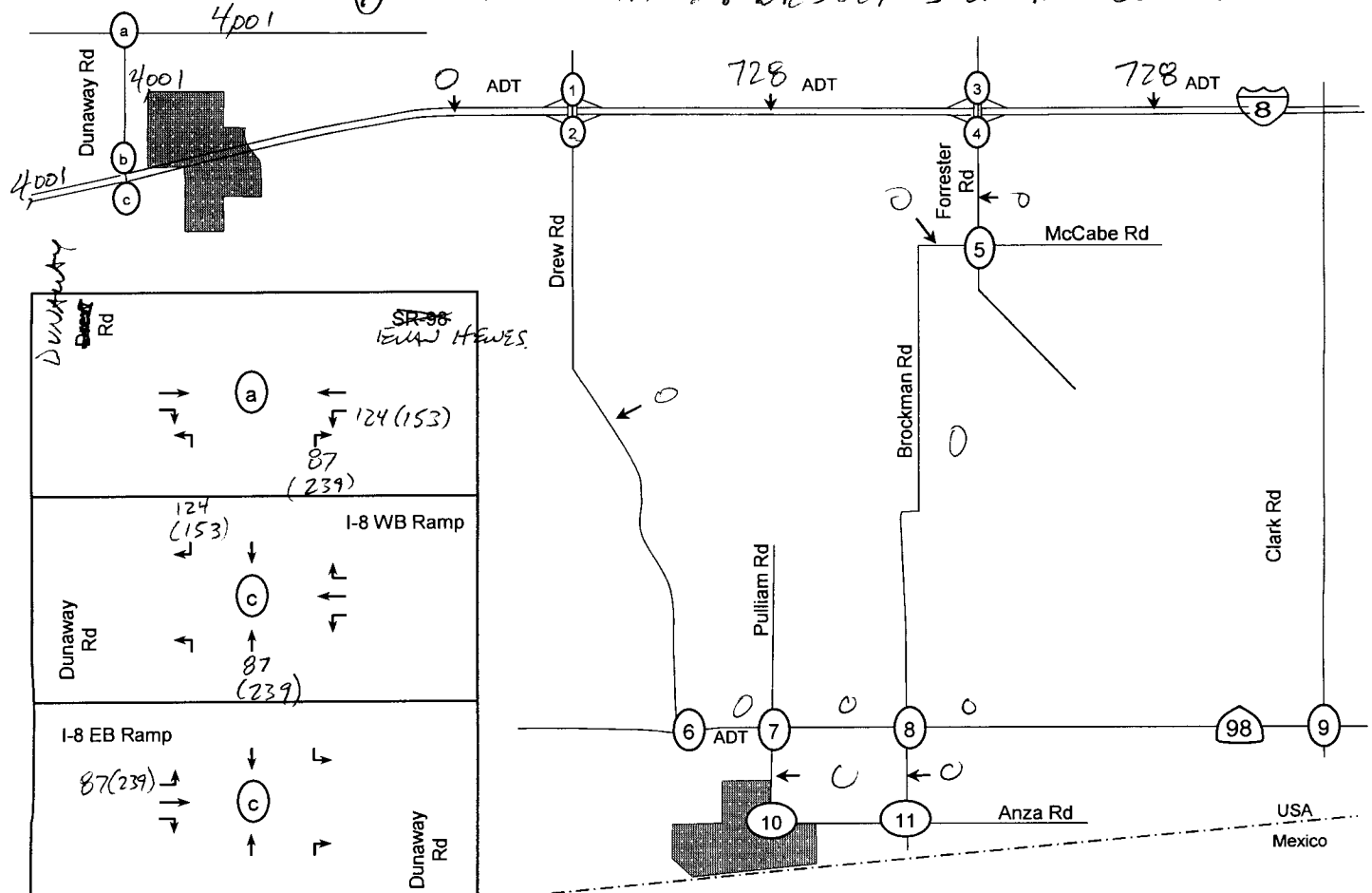
YEAR 2015 PROJECT

INTERSECTION TRAFFIC VOLUMES-SOUTH



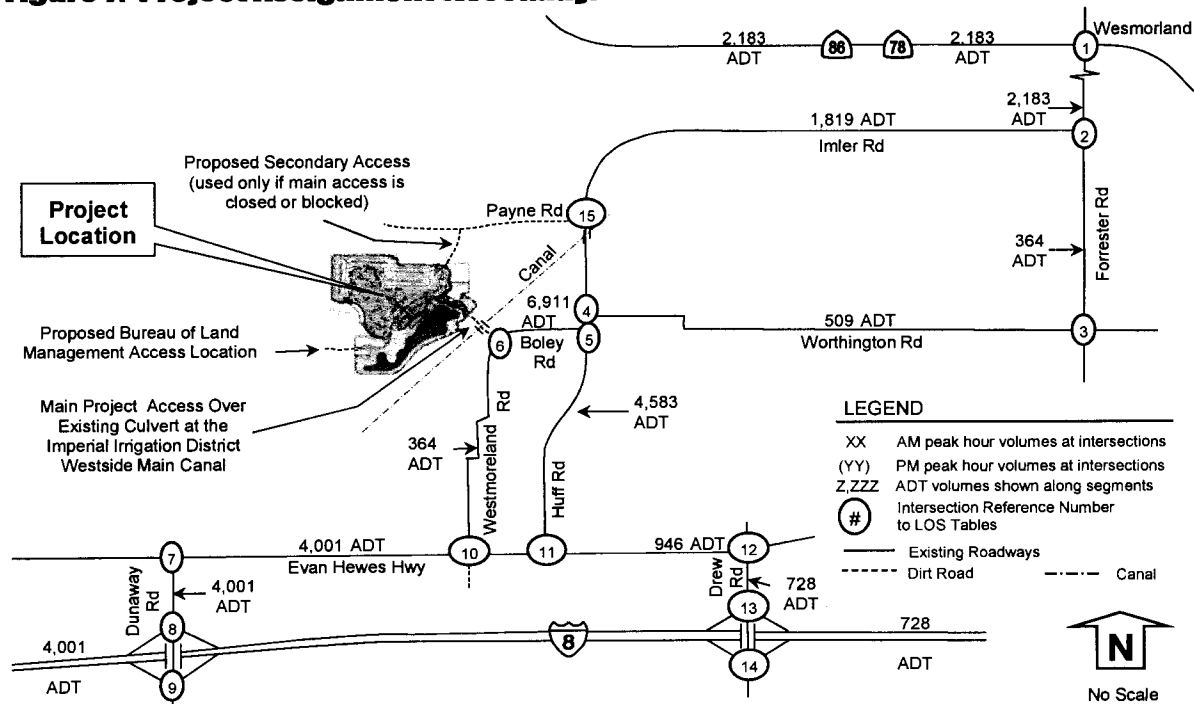
**Figure 15: Project Assignment (All Phases)**

# CUMULATIVE: DESERT SPRINGS RESORT



<p>Intersection 1: Dunaway Rd/I-8 WB Ramp. AM peak volume: 124 (153). PM peak volume: 87 (239).</p>	<p>Intersection 2: Dunaway Rd/I-8 EB Ramp. AM peak volume: 87 (239). PM peak volume: 87 (239).</p>	<p>Intersection 3: I-8 WB Ramp/Drew Rd. AM peak volume: 22 (28). PM peak volume: 16 (44).</p>
<p>Intersection 4: I-8 EB Ramp/Forrester Rd. AM peak volume: 23 (28). PM peak volume: 23 (28).</p>	<p>Intersection 5: Forrester Rd/McCabe Rd. AM peak volume: 22 (28). PM peak volume: 22 (28).</p>	<p>Intersection 6: Pulliam Rd/SR-98. AM peak volume: 23 (28). PM peak volume: 23 (28).</p>
<p>Intersection 7: Brockman Rd/SR-98. AM peak volume: 22 (28). PM peak volume: 22 (28).</p>	<p>Intersection 8: Clark Rd/SR-98. AM peak volume: 23 (28). PM peak volume: 23 (28).</p>	<p>Intersection 9: Clark Rd/Anza Rd. AM peak volume: 23 (28). PM peak volume: 23 (28).</p>
<p>Intersection 10: Pulliam Rd/Anza Rd. AM peak volume: 22 (28). PM peak volume: 22 (28).</p>	<p>Intersection 11: Brockman Rd/Anza Rd. AM peak volume: 22 (28). PM peak volume: 22 (28).</p>	<p><b>LEGEND</b></p> <ul style="list-style-type: none"> <li>XX AM peak hour volumes at intersections</li> <li>(YY) PM peak hour volumes at intersections</li> <li>Z,ZZZ ADT volumes shown along segments</li> <li># Intersection Reference Number to LOS Tables</li> <li>Existing Roadways</li> </ul>

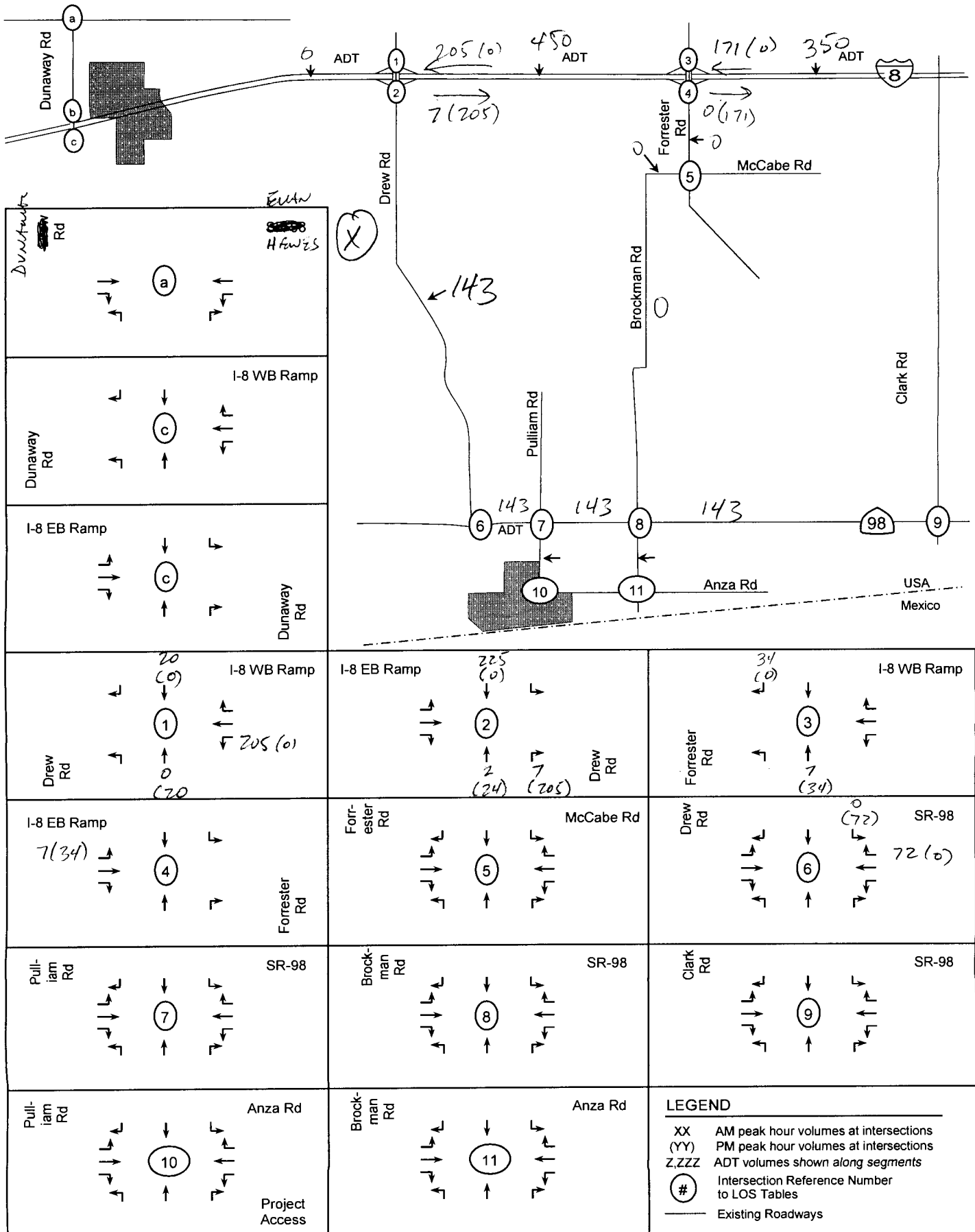
**Figure 7: Project Assignment (Weekday)**



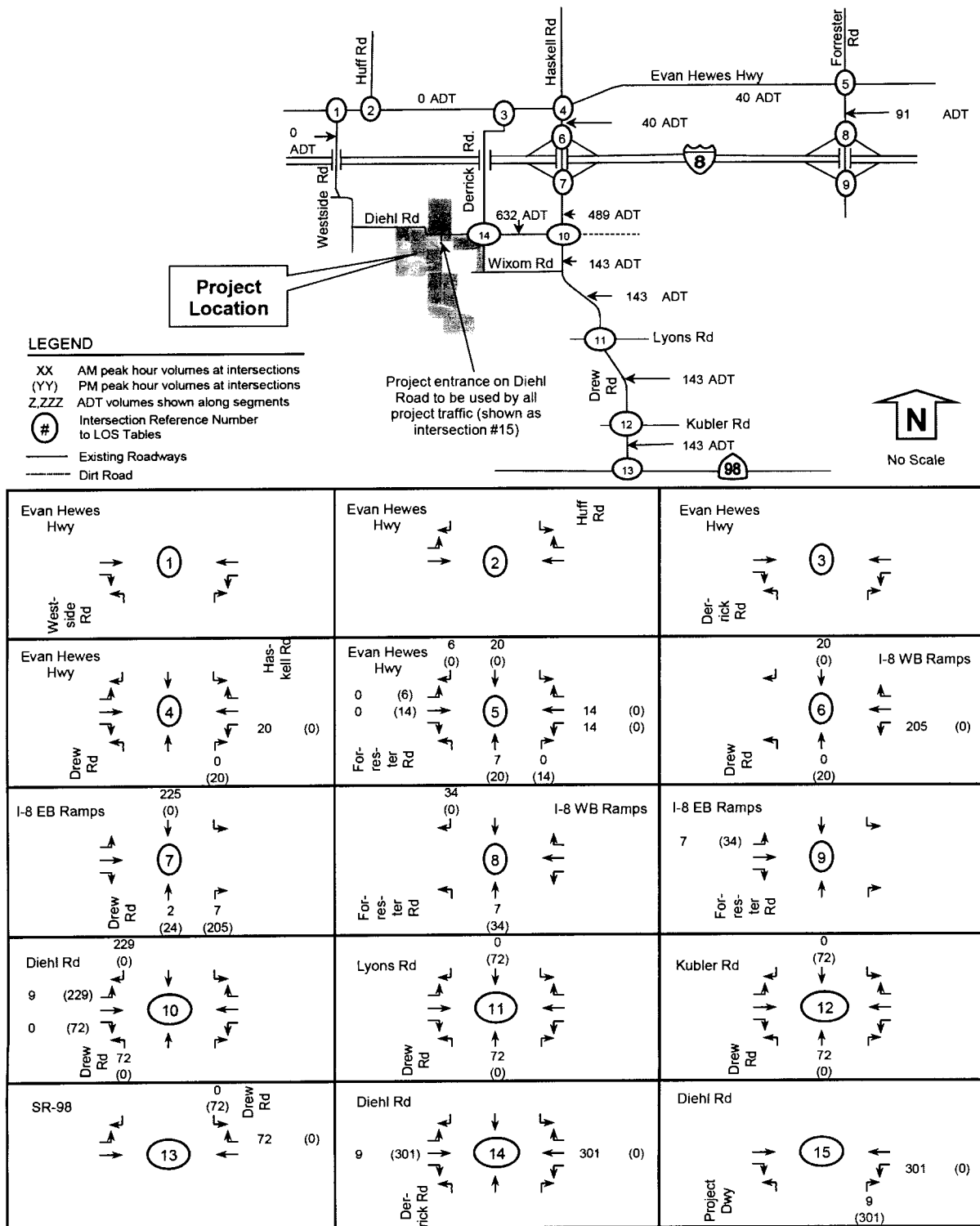
<b>SR-78/86</b> 	<b>Imler Rd.</b> 	<b>Worthington Rd.</b> 
<b>Worthington Rd.</b> 	<b>Boley Rd.</b> 	<b>Boley Rd./ Project Driveway</b> 
<b>Evan Hewes Hwy.</b> 	<b>I-8 Westbound Ramp</b> 	<b>I-8 Eastbound Ramp</b> 
<b>Evan Hewes Hwy.</b> 	<b>Evan Hewes Hwy.</b> 	<b>Evan Hewes Hwy.</b> 
<b>I-8 Westbound Ramp</b> 	<b>I-8 Eastbound Ramp</b> 	<b>Payne Rd.</b> 

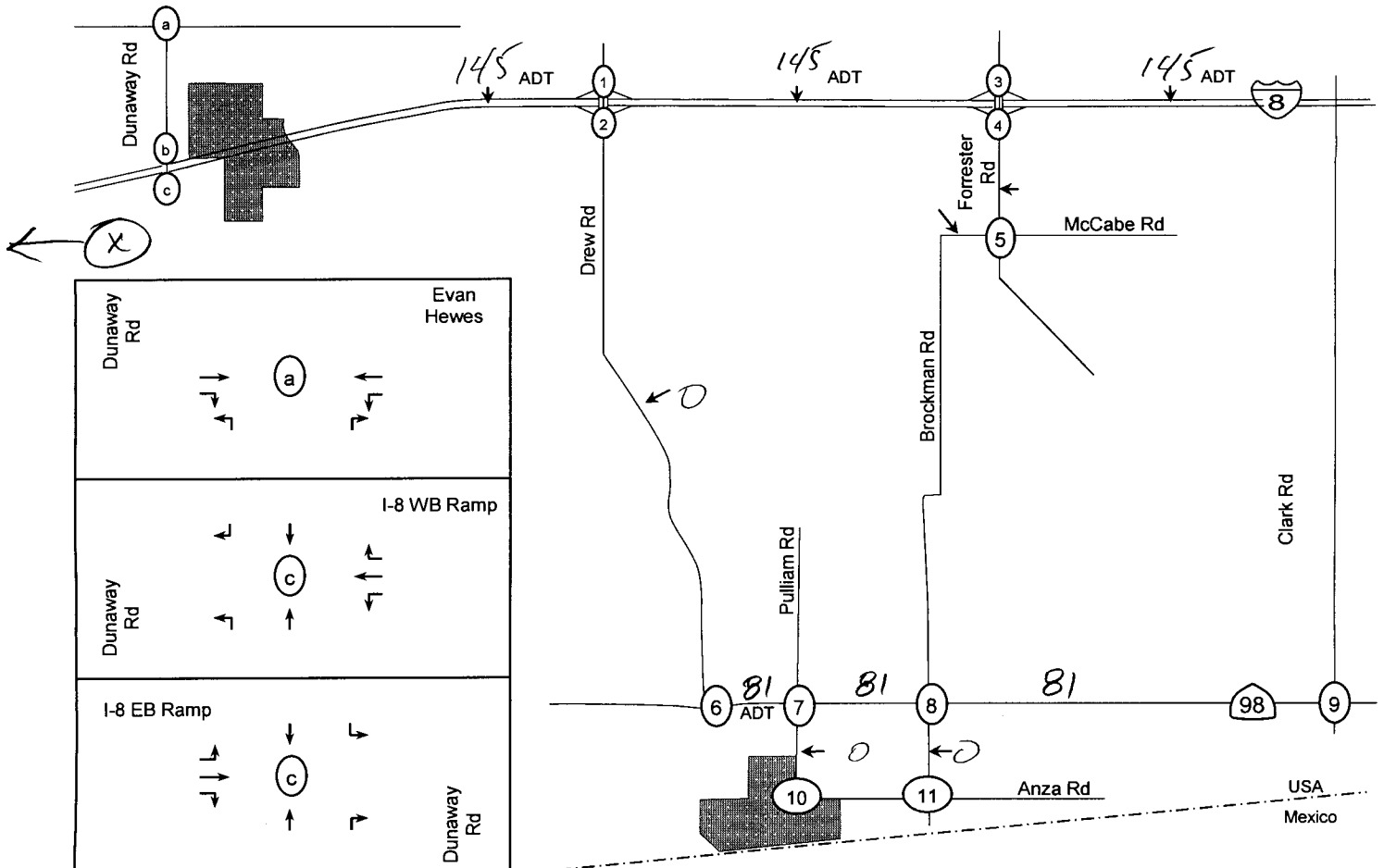
# CUMULATIVE: MT SIGNAL CONSTRUCTION

15



**Figure 10: Construction Trucks & Workforce Assignment (Option 1: 100% Local)**





<p>Dunaway Rd</p> <p>Evan Hewes</p> <p>(a)</p>		
<p>Dunaway Rd</p> <p>I-8 WB Ramp</p> <p>(c)</p>		
<p>I-8 EB Ramp</p> <p>Dunaway Rd</p> <p>(c)</p>		
<p>I-8 WB Ramp</p> <p>Drew Rd</p> <p>(1)</p>	<p>I-8 EB Ramp</p> <p>Drew Rd</p> <p>(2)</p>	<p>I-8 WB Ramp</p> <p>Forrester Rd</p> <p>(3)</p>
<p>I-8 EB Ramp</p> <p>Forrester Rd</p> <p>(4)</p>	<p>Forrester Rd</p> <p>McCabe Rd</p> <p>(5)</p>	<p>Drew Rd</p> <p>SR-98</p> <p>(6)</p>
<p>Pulliam Rd</p> <p>SR-98</p> <p>(7)</p>	<p>Brockman Rd</p> <p>SR-98</p> <p>(8)</p>	<p>Clark Rd</p> <p>SR-98</p> <p>(9)</p>
<p>Pulliam Rd</p> <p>Anza Rd</p> <p>(10)</p> <p>Project Access</p>	<p>Brockman Rd</p> <p>Anza Rd</p> <p>(11)</p>	<p><b>LEGEND</b></p> <p>XX AM peak hour volumes at intersections</p> <p>(YY) PM peak hour volumes at intersections</p> <p>Z,ZZZ ADT volumes shown along segments</p> <p>(#) Intersection Reference Number to LOS Tables</p> <p>Existing Roadways</p>

## 2.0 EXECUTIVE SUMMARY

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This section provides an overview of the project and the environmental analysis. For additional detail regarding specific issues, please consult the appropriate chapter of Sections 4.1 through 4.15 (Environmental Setting, Impacts, and Mitigation Measures) of the Draft Environmental Impact Report (DEIR).

### 2.1 PURPOSE AND SCOPE OF THE ENVIRONMENTAL IMPACT REPORT

This Environmental Impact Report (EIR) will provide a reasonably thorough analysis of the potential environmental effects associated with the implementation of the Coyote Wells Specific Plan project, pursuant to the California Environmental Quality Act (CEQA).

This EIR analysis focuses upon potential environmental impacts arising from the project. The EIR adopts this approach in order to provide a credible worst-case scenario of the impacts resulting from project implementation.

### 2.2 PROJECT CHARACTERISTICS

The Coyote Wells Specific Plan (project) proposes a mixed-use, three-phase development on approximately 944 acres in western Imperial County. The proposed project is located within the Ocotillo/Nomirage Community Area Plan. The proposed Specific Plan would consist of twenty-two (22) parcels and ten (10) land use designations. The project is located within the Ocotillo/Nomirage Community Area Plan in an unincorporated area of Imperial County. It would be comprised of two main components, the open space/recreational area and the open space/preservation area. Within these major areas are other land uses including open space, recreation, education and training, tourism, residential, storage, hotel/resort, and infrastructure land uses.

It is anticipated that full implementation of the Coyote Wells Specific Plan will occur in three (3) phases and span a total of nine (9) years. For planning and permitting purposes, Wind Zero Group, Inc. has developed projections for the total number of State Route 98 development users, law enforcement trainee participants, motorsports enthusiast participants and employees associated with the Coyote Wells Specific Plan Area. These projections appear in the sections dedicated to each defined area.

### 2.3 AREAS OF CONTROVERSY

The County of Imperial was identified as the lead agency for the proposed project. In accordance with Section 15082 of the CEQA Guidelines, the County prepared and distributed a Notice of Preparation (NOP) of an EIR on January 23, 2009. This notice was circulated to the public, local, state, and federal agencies, and other interested parties to solicit comments on the proposed project. The NOP is presented in Appendix A in the DEIR. In addition, an Initial Study was prepared for the project and released for public review at the same time as the NOP. The Initial Study is also included in Appendix A in the DEIR.

The NOP and Initial Study identified the following potential environmental impacts of the proposed project, which are evaluated in this EIR:

Concerns raised in response to the NOP were considered during the preparation of the Draft EIR. Comment letters are presented in Appendix A in the DEIR.

- **Geology and Soils** Address the use of septic systems for this type and size of project and discuss and analyze feasibility/alternative use of a wastewater treatment facility.

## 4.13 TRANSPORTATION AND CIRCULATION

Coyote Wells Specific Plan Trip Generation	Daily	AM Peak Hour			PM Peak Hour		
		In	Out	Total	In	Out	Total
Weekday Trip Generation							
Coyote Wells Specific Plan Phase I	538	102	32	134	32	102	134
Coyote Wells Specific Plan Phase II	2,648	243	106	349	122	251	373
Coyote Wells Specific Plan Phase III	4,391	555	199	754	217	565	782
Weekend Trip Generation							
Coyote Wells Specific Plan Phase I	750	137	50	188	50	138	188
Coyote Wells Specific Plan Phase II	3,073	314	141	455	157	322	479
Coyote Wells Specific Plan Phase III	5,266	689	283	973	301	699	1,001

**Notes:**

Some error due to rounding

1 Trip rate shown for Law Enforcement Training Facility is based on SANDAG "Military" with a more conservative estimate of PM peak hour travel to reflect the limited off-site trips due to the wide range of amenities provided on-site

2 Law Enforcement Training Participants and Full Time Employee (FTE) from Coyote Wells Specific Plan

3 Similar to the Law Enforcement Training Facility, trip generation rates for the Motorsports Facility is based on SANDAG "Military" with more conservative estimate of daily trips and modified estimate of peak hour movements to reflect the greater likelihood of Motorsports Facility Users to visit off-site facilities than Law Enforcement Training Facility Participants

4 Motorsports Facility Users and FTE (including Resort Hotel) from Coyote Wells Specific Plan

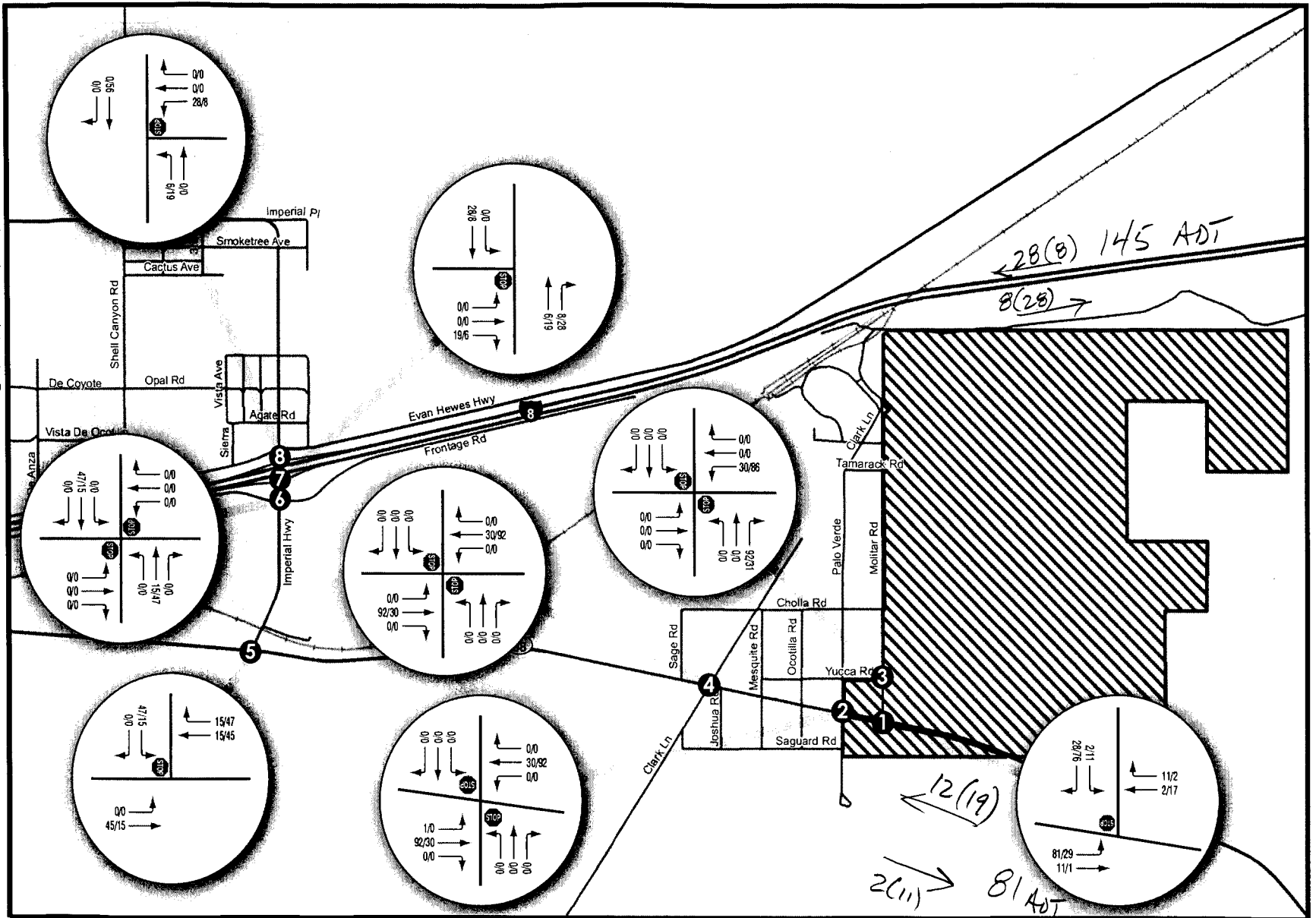
5 Trip rate per SANDAG "Gasoline with Food Mart"

6 Trip rate per SANDAG "Fast Food (without drive-through)"

7 Trip rate per SANDAG "Storage"

8 Trip rate per SANDAG "Estate, Urban or Rural (average 1-2 DU/acre)"

Source: PMC, 2009



**Figure 4.13-5**

Phase I Project Weekday Traffic Volumes AM/PM Peak Hours

**PMC**

CUMULATIVE PROJECT

TRAFFIC STUDY

FOR

GRANITE CARROLL SAND AND GRAVEL MINE

IN THE  
COUNTY OF IMPERIAL

*Submitted To:*

GRANITE CONSTRUCTION COMPANY  
38000 Monroe Street  
Indio, CA 92203

*Submitted By:*

DARNELL & ASSOCIATES, INC.  
1446 Front Street, Third Floor  
San Diego, CA 92101  
619-233-9373

*September 2, 2009*

070307 ocotillo-rp13-09-02-09/09-09

PG ORIGINAL PKG

## EXECUTIVE SUMMARY

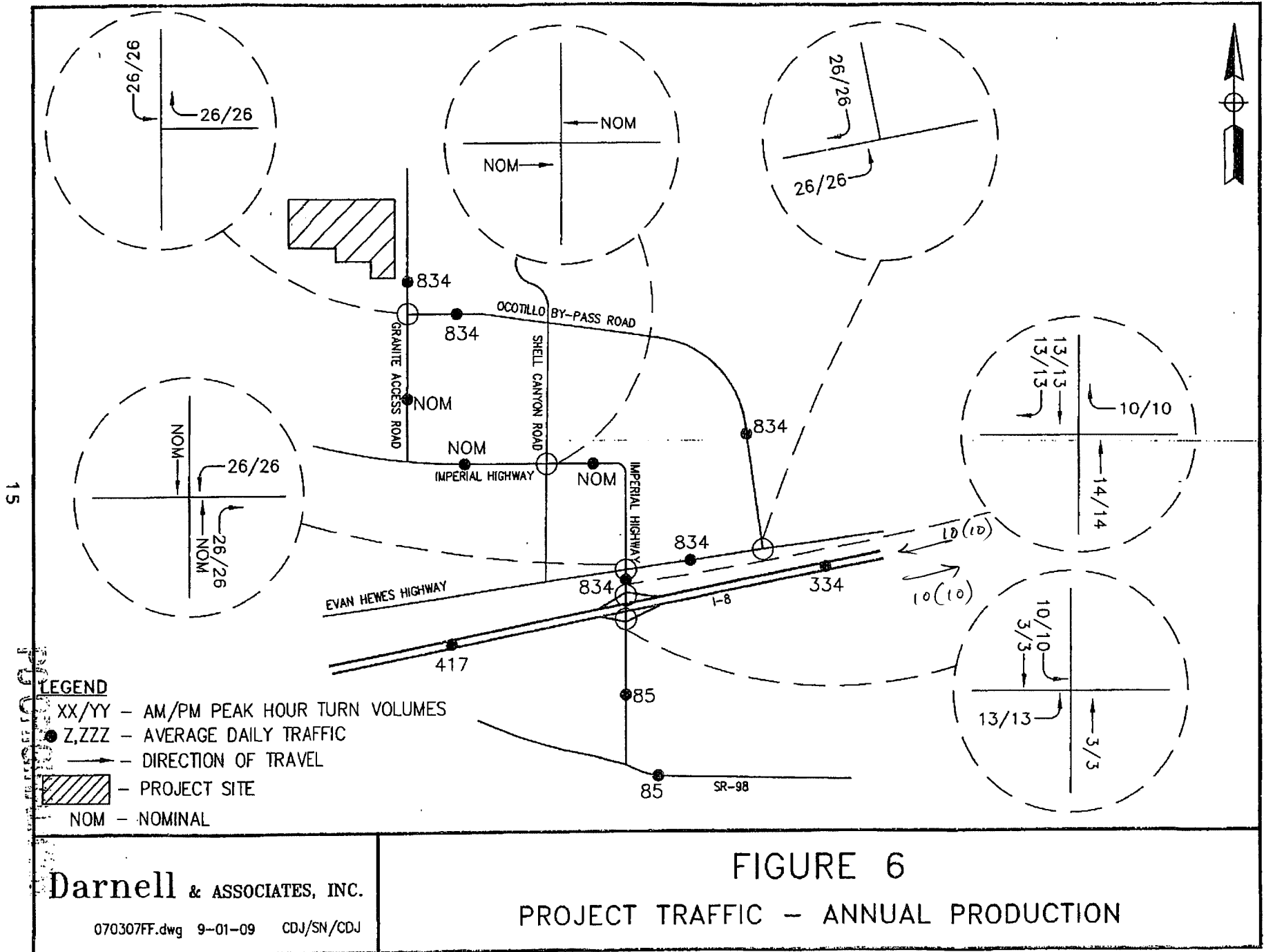
The proposed Granite Carroll Sand and Gravel Mine consists of 379.53 acres (based on the annual maximum permit production of 1,082,570 cubic yards/year) and is located four (4) miles northwest of the community of Ocotillo in the County of Imperial. The project site is accessed via the Imperial Highway exit from Interstate 8, then via Evan Hewes Highway and the private Ocotillo By-Pass Road.

**The proposed project is estimated to generate a total of 196 trucks in and 196 trucks out per day.** For analysis purpose all truck trips were converted into passenger car equivalent (PCE) trips by using a PCE factor of two (2) passenger car equivalent trips per truck (i.e. every truck trip is multiplied by 2). Therefore since the proposed project anticipates to have 196 trucks in and 196 trucks out per day; the number of trucks/day is multiplied by two (2) PCE factor which would generate at total of 392 one-way PCE trips (trips entering the project site) and a total of 392 one-way PCE trips (trips exiting the project site). Thus, adding the entering and exiting truck traffic together there would be a total of 784 average daily PCE trips per day (two-way daily trips) for the proposed project.

The Granite Carroll Sand and Gravel Mine is estimated to have twenty (20) employees. The employee trips were estimated at the rate of 2.5 trips per employee per day (i.e. leaving for lunch, breaks); thus, the employee's will generate 50 two-way daily trips ( $20 \text{ people} \times 2.5 = 50$  two-way trips entering and exiting the project site).

Currently, the CMP threshold is 2,400 average daily trips (ADT) or 200 peak hour trips. The proposed project will generate 834 (417 in, 417 out) average daily PCE trips (ADT), 52 (26 in, 26 out) AM peak hour PCE trips, and 52 (26 in, 26 out) PM peak hour PCE trips; therefore, is not subject to CMP guidelines for traffic impact studies. It should be noted that the analysis process in this report follows the CMP traffic study guidelines even though the project does not require CMP analysis.

The proposed project does not have any significant impacts on roadway segments or intersections in its vicinity under Year 2013 plus approved/pending projects plus project conditions and Year 2035 plus approved/pending projects plus project conditions.



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*CUMULATIVE: IMPERIAL VALLEY SOLAR*  
*(FORMERLY SES SOLAR II)*

## **EXECUTIVE SUMMARY**

Christopher Meyer

### **INTRODUCTION**

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Imperial Valley Solar, LLC (formerly Stirling Energy Systems Solar Two, LLC) is seeking approval to construct and operate the Imperial Valley Solar (formerly the Stirling Energy Systems Solar Two) Project and its ancillary facilities. The applicant is a wholly owned subsidiary of Tessera Solar. The main objective of the Imperial Valley Solar (IVS) Project is to provide clean, renewable, solar-powered electricity to the State of California. The electricity from the IVS Project would assist the State in meeting its objectives as mandated by the California Renewable Portfolio Standard (RPS) Program and the California Global Warming Solutions Act. The IVS Project would also address other local mandates adopted by California's electric utilities for the provision of renewable energy.

San Diego Gas & Electric (SDG&E) selected the IVS Project to help meet its objectives under the legislative requirements of the RPS Program through a least-cost, best-fit competitive solicitation. Because the IVS Project is one of the three projects that SDG&E selected from the solicitation, the applicant and SDG&E entered into a 20-year Power Purchase Agreement (PPA) for the provision of renewable electricity. This PPA would help SDG&E meet both its statutory mandate to purchase at least 20% of its electric power from renewable resources by 2010 and its future electricity requirements. The California Public Utilities Commission approved the PPA on December 1, 2005. The IVS Project represents approximately 44% of SDG&E's RPS goals.

The applicant has submitted an Application for Certification (AFC) to the California Energy Commission (Energy Commission) for the proposed project. The Energy Commission is the lead State agency responsible for evaluating the environmental effects of project and for complying with the California Environmental Quality Act (CEQA). The project proposes the use of land managed by the United States Department of the Interior, Bureau of Land Management (BLM); therefore the applicant has submitted a request for a right-of-way grant to the BLM. The BLM is the federal lead agency for the evaluation of project effects and compliance of the proposed project with the requirements of the National Environmental Policy Act (NEPA) related to possible BLM discretionary actions related to the right-of-way grant request.

The BLM and the Energy Commission prepared separate final documents for compliance with NEPA and CEQA, respectively. Specifically, the BLM is preparing the Final Environmental Impact Statement (FEIS) and the Energy Commission prepared this Supplemental Staff Assessment (SSA). The Staff Assessment/Draft Environmental Impact Statement (SA/DEIS) was the primary reference used by the BLM in preparing the FEIS and is incorporated by reference in the BLM's FEIS for the IVS Project. After the publication of the FEIS, the BLM will prepare a Record of Decision (ROD) regarding the Agency Preferred Alternative. The publication of the ROD in the Federal Register is the final step required of the BLM to meet the requirements of NEPA for the IVS Project. While the Energy Commission SSA is not written jointly with the BLM, the proponent will be required to comply with all terms and conditions required by the BLM, as will be

described in the BLM's Record of Decision and Right-of-Way grant documents for this project. The conditions of certification within this document may also require the submittal of documents and reports to other federal, state, or local agencies. It is the project owner's responsibility to ensure the timely submittal of these documents and reports.

The Energy Commission staff identified significant unmitigable impacts to Biological Resources, Land Use, Soil & Water Resources, and Visual Resources. Impacts to Cultural Resources are being analyzed and will be addressed in a document filed subsequently to this document. Because many of the unmitigable impacts identified by staff could be significantly reduced through implementation of Drainage Alternative #1, the Energy Commission staff recommends that it, rather than the proposed project, be approved by the Energy Commission. The BLM has addressed the reduction of potential impacts identified in the FEIS by coordinating with the U.S. Army Corps of Engineers (USACE) on identifying and analyzing a draft Least Environmentally Damaging Alternative (LEDPA). A final LEDPA will ultimately be identified by USACE and will be required in order for the project to proceed. The Energy Commission staff believe that when the LEDPA is finalized, it will be similar to Drainage Alternative #1 recommended by staff.

## **PROPOSED PROJECT**

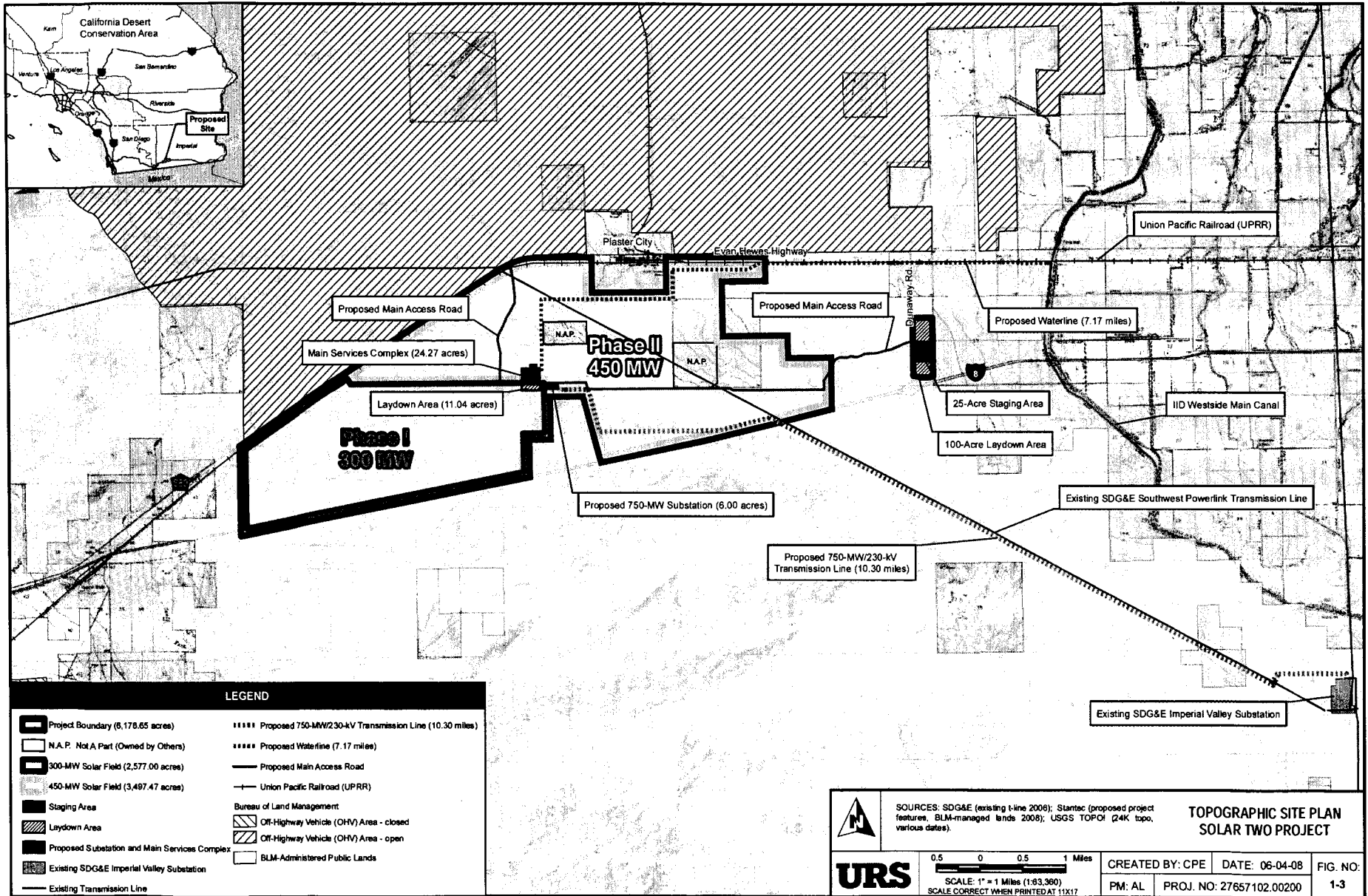
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### **Project Location and Description**

The applicant intends to develop an electric-generating facility with a nominal capacity of 750 megawatts (MW) using concentrated solar power. The IVS Project would be constructed on an approximately 6,500-acre (just over 10 square miles) site in the Imperial Valley in Imperial County, California. The site is approximately 100 miles east of San Diego, 14 miles west of El Centro, and 4 miles east of Ocotillo Wells. The IVS Project site is predominantly comprised of BLM managed lands with some private parcels within the approximately 6,500 acre site. Key features of the proposed project are described briefly below and in more detail in the following sections:

The electric-generating facility would include the construction of a new 230-kilovolt (kV) substation approximately in the center of the project site, an operation and administration building, a maintenance building, and a substation building.

The IVS Project as proposed would be constructed in two phases: Phase I would consist of up to 12,000 SunCatchers configured in 200 1.5-MW solar groups of 60 SunCatchers per group. The total net nominal generating capacity of Phase 1 is 300 MW. Phase I would require approximately 2,600 acres. The renewable energy from Phase I would be transmitted via the existing 500-kV SDG&E Southwest Powerlink transmission line. The IVS Project would be connected to the grid at the SDG&E Imperial Valley Substation via a 10.3-mi long, 230-kV interconnection transmission line that would be constructed as part of the project in a corridor parallel to the existing Southwest Powerlink transmission line.



**SECTION FIVE****Environmental Information**

**Table 5.11-6  
Project Construction Trip Generation**

Vehicle Type	Peak Daily Round Trips	Morning Peak Trips			Evening Peak Trips		
		Inbound	Outbound	Total	Inbound	Outbound	Total
Construction worker vehicles <sup>1</sup>	1,462	731	0	731	0	731	731
Truck deliveries <sup>2</sup>	274	41	0	41	0	41	41

Source: SES Solar Two, LLC, 2008.

Notes:

<sup>1</sup>Peak workforce was conservatively analyzed at 731 worker trips conservatively assumed to drive alone during both the morning (0700 to 0900) and evening (1600 to 1800) peak hours.

<sup>2</sup>Trucks deliveries shown in the table were adjusted into PCE vehicles (3 PCE per month). 1,099 truck trips per month = 3,297 PCEs divided by 24 working days = 137 PCE one-way trips or 274 round trips per day on average. It was also assumed that 30 percent of the truck delivery trips arrive during the morning peak hour and leave during the evening peak hour while the remaining deliveries (70 percent) would arrive and leave during off-peak hours.

PCE = passenger car equivalent

### ***Project Operations Trip Generation***

During Project operations, the Project study area will experience increases in traffic associated primarily with operation worker commute and operation and maintenance (O&M) trips. Some visitor trips were also assumed for a proposed visitor center that could potentially be built on-site. The traffic analysis evaluated the worst-case Project operations scenario by accounting for both planned (operations and delivery) and future visitor trips within the Project study area.

#### **Operations**

The operational workforce projections provided by the Project design engineer estimated that by Year 7 of Project operations, up to 164 workers will be working on-site on a daily basis. The estimated vehicle requirements for operational workers include 100 cars and 4 van pool vehicles. The operational projections also included 8 daily visitor trips for sales, deliveries, and other services. To evaluate the worst-case scenario, these vehicle trips were assumed to arrive during the morning peak period (0700 to 0900) and depart during the evening peak period (1600 to 1800).

#### **Deliveries**

To sustain and support Project operations, five weekly delivery trips of hydrogen, O&M supplies, waste management, and hazardous waste handling are anticipated at the Project Site. In addition, one weekly tractor trailer trip is anticipated for spare parts, building supplies, and temporary rental equipments. It is estimated that there will be an average of 12 truck round trips or 36 PCE operational delivery round trips on a daily basis accessing the Project Site during operations. Delivery trips will likely arrive and depart throughout the day. The analysis assumed the worst-case scenario: that these trips occur on the same day.

## SECTION FIVE

## Environmental Information

### Project Site Visits

The Project trip generation data in Table 5.11-7, Project Operations Trip Generation, show the resultant trips that would be generated by operations, deliveries, and Project Site trips.

**Table 5.11-7**  
**Project Operations Trip Generation**

Vehicle Type	Peak Daily Round Trips <sup>1</sup>	Morning Peak Trips			Evening Peak Trips		
		Inbound	Outbound	Total	Inbound	Outbound	Total
Operations	224	112	0	112	0	112	112
Deliveries <sup>2</sup>	36	9	5	14	0	4	4
Visitor Center	20	5	5	10	5	5	10

Source: SES Solar Two, LLC, 2008; URS Corporation, 2008.

Notes:

<sup>1</sup>Peak workforce was conservatively analyzed at 731 worker trips conservatively assumed to drive alone during both the morning (0700 to 0900) and evening (1600 to 1800) peak hours.

<sup>2</sup>Trucks deliveries shown in the table were adjusted into PCE vehicles (3 PCE per month).

PCE = passenger car equivalent

### Project Trip Distribution

#### Trip Distribution and Assignment

It is assumed that workers will come from Imperial and adjoining counties. As shown in Table 5.11-8, Workforce Distribution, it is anticipated that the construction and operation workforces will be originating from the following geographical areas:

- Imperial County,
- San Diego County, and
- Riverside County.

**Table 5.11-8**  
**Workforce Distribution**

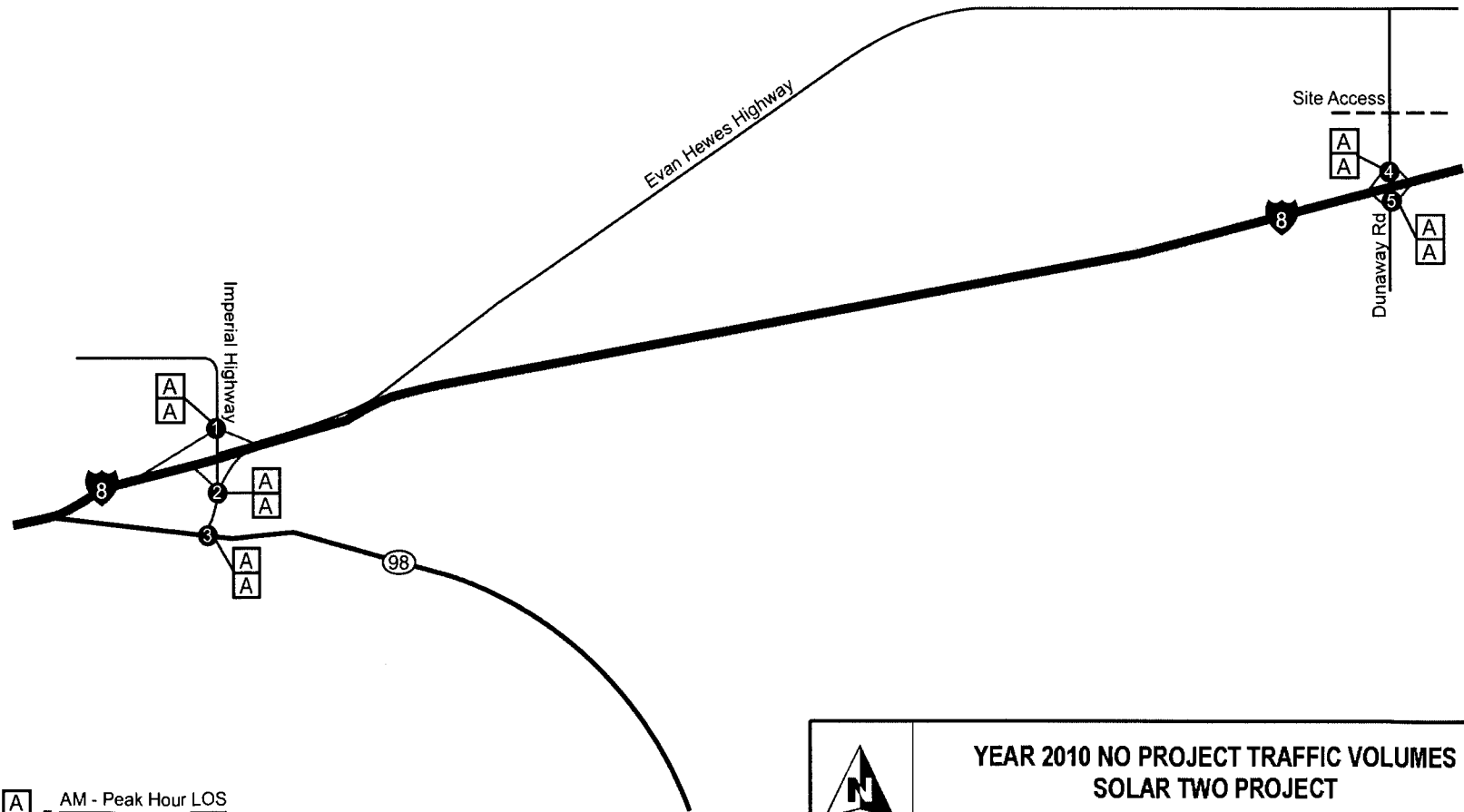
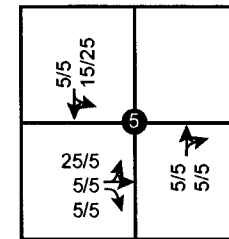
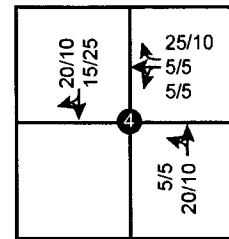
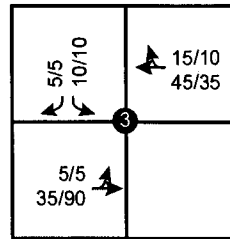
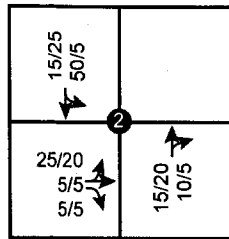
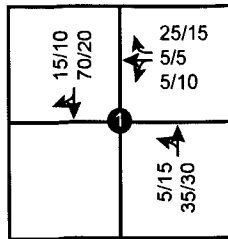
Origin of Workforce Vehicle Travel to Project Site	Construction Workforce	Operation Workforce
I-8 East (Imperial County)	60.0%	65.0%
I-8 East (outside of Imperial County)	5.0%	1.0%
Evan Hewes Highway east (local)	15.0% ✓	23.0%
I-8 West (Imperial County)	5.0%	5.0%
I-8 West (outside of Imperial County)	10.0%	5.0%
Evan Hewes Highway west (Local)	5.0%	1.0%
<b>Totals</b>	<b>100.0%</b>	<b>100.0%</b>



Source: SES Solar Two, LLC, 2008; URS Corporation, 2008.

Notes:


% = percent

I-8 = Interstate 8

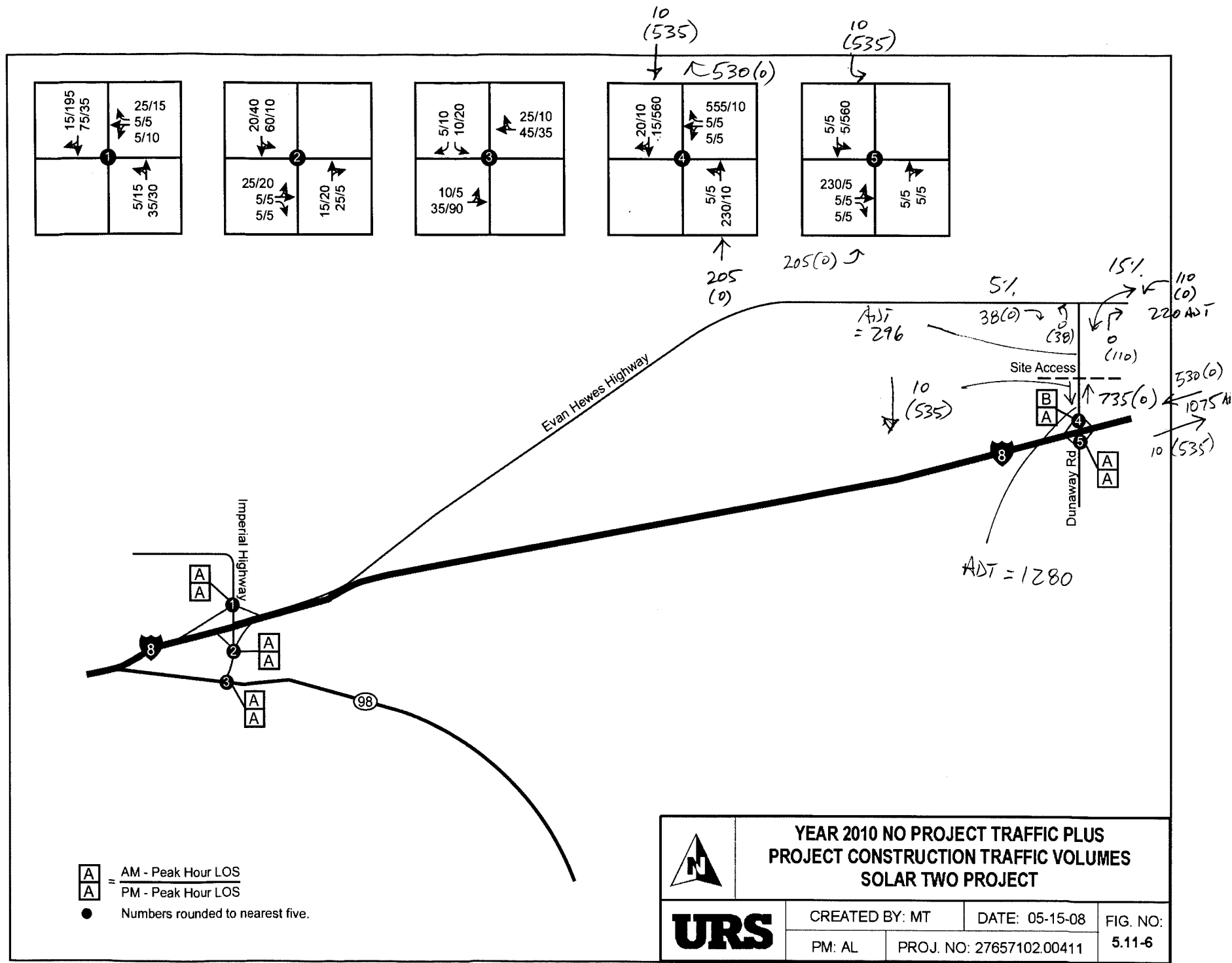


 = AM - Peak Hour LOS  
 = PM - Peak Hour LOS

● Numbers rounded to nearest five.

	<b>YEAR 2010 NO PROJECT TRAFFIC VOLUMES SOLAR TWO PROJECT</b>		
	CREATED BY: MT PM: AL	DATE: 05-15-08 PROJ. NO: 27657102.00411	FIG. NO: 5.11-5

K:/2008/SES Solar 2/figure 5.11-5.ai



K:/2008/SES Solar 2/figure 5.11-6.ai

## 4.0 Project Description

The project is a photovoltaic solar facility capable of producing approximately 200 megawatts of electricity on approximately 950 acres of agricultural land. The project is generally located east of Drew Road and south of SR-98.

### 4.1 Project Trip Generation

The project trip generation consists of a construction phase and operations phase. The construction phase will have the highest intensity followed by an operations phase with significantly fewer trips. This section describes the construction and operations trip generation.

#### 4.1.1 Construction Trip Generation

Construction of the project includes site preparation, foundation construction, erection of major equipment and structures, installation of electrical systems, control systems, and start-up/testing. These construction activities are expected to require approximately 17 months. According to the applicant, the construction workforce is expected to reach a peak of approximately 250 workers with hours generally between 7am and 3pm Monday through Friday. Additionally, equipment deliveries and construction trucks will serve the project site. The highest construction phase of the project is calculated to generate 680 ADT with 271 AM peak hour trips (265 inbound and 6 outbound) and 280 PM peak hour trips (15 inbound and 265 outbound) as shown in **Table 8**.

**TABLE 8: PROJECT TRIP GENERATION SUMMARY**

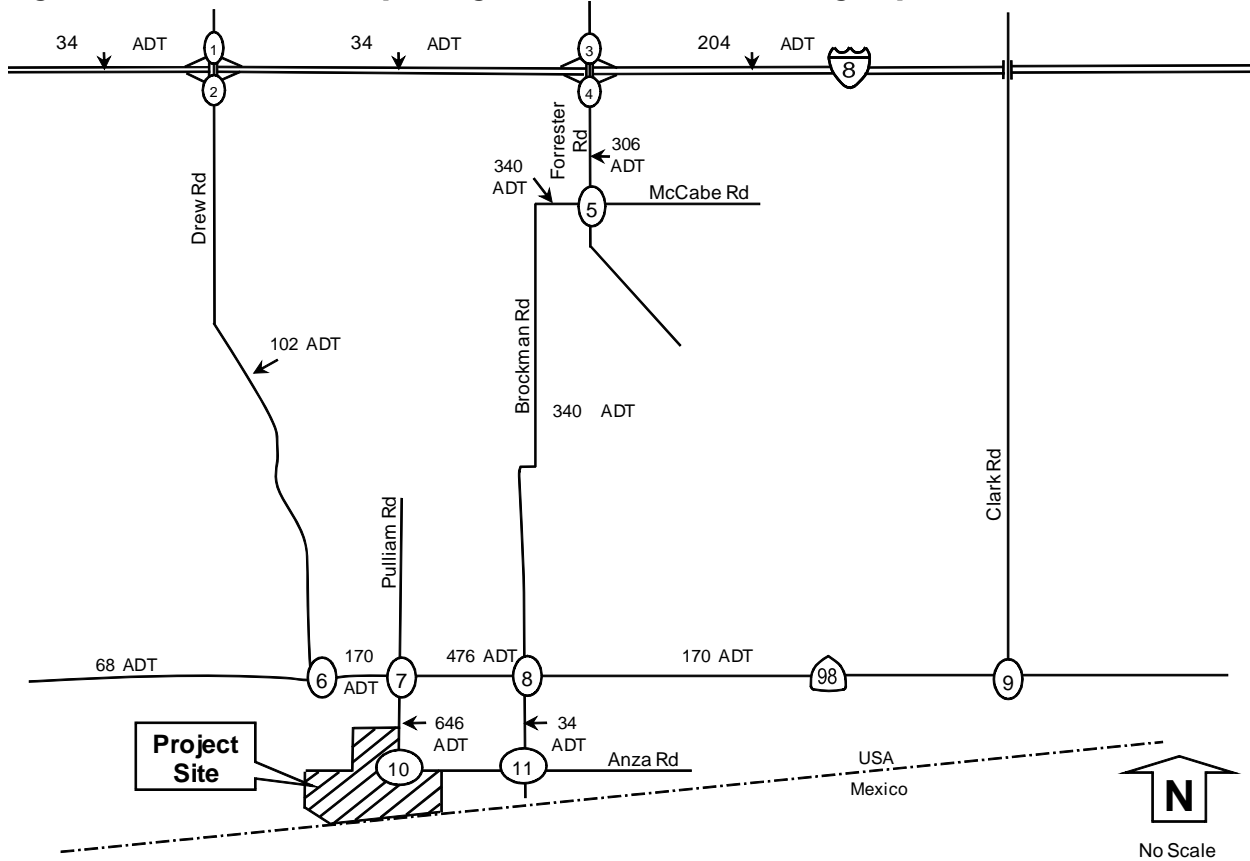
Proposed Construction Related Traffic	ADT	AM		PM	
		IN (7am)	OUT (7am)	IN (3pm)	OUT (3pm)
Peak Construction Workers <sup>1</sup>	500	250	0	0	250
Equipment Deliveries and Construction Truck Trips (with PCE) <sup>2</sup>	180	15	6	15	15
Total Traffic During Peak Construction Period	<b>680</b>	<b>265</b>	<b>6</b>	<b>15</b>	<b>265</b>

Notes: 1) Number of construction workers estimated by applicant. 2) Passenger Car Equivalent (PCE) factor of 3 applied to each truck; therefore, 180 ADT equals 30 daily trucks. Number of trucks based on another power station with similar number of construction workers.

#### 4.1.2 Project Operations and Maintenance Trip Generation

According to the applicant, the project will primarily operate during daylight hours and will require approximately 4 fulltime personnel for operations and maintenance. The project site will be staffed with a security guard 24 hours per day, seven days per week. Based on this information, the operations and maintenance trip generation is estimated at 10 to 15 ADT with 4 AM and 4 PM peak hour trips. Therefore, the higher and more conservative construction trip generation is used to determine potential project impacts.

**Figure 7: Construction Trip Assignment (Drew Interchange Open)**



<p>Drew Rd</p> <p>13 (1) I-8 WB Ramp</p> <p>13 (1)</p> <p>13 (13)</p> <p>13 (13)</p>	<p>I-8 EB Ramp</p> <p>26 (2)</p> <p>13 (1)</p> <p>0 (26)</p> <p>0 (13)</p> <p>Drew Rd</p>	<p>40 (2) I-8 WB Ramp</p> <p>80 (5)</p> <p>2 (40)</p> <p>Forrester Rd</p>
<p>I-8 EB Ramp</p> <p>120 (7)</p> <p>2 (40)</p> <p>2 (80)</p> <p>Forrester Rd</p>	<p>Forrester Rd</p> <p>120 (7)</p> <p>3 (120)</p> <p>0 (13)</p> <p>5</p> <p>13 (1)</p> <p>McCabe Rd</p>	<p>Drew Rd</p> <p>27 (1)</p> <p>6</p> <p>39 (3)</p> <p>1 (39)</p> <p>1 (27)</p> <p>SR-98</p>
<p>Pulliam Rd</p> <p>66 (4)</p> <p>2 (66)</p> <p>4 (186)</p> <p>7</p> <p>186 (11)</p> <p>SR-98</p>	<p>Brockman Rd</p> <p>127 (7)</p> <p>3 (127)</p> <p>1 (59)</p> <p>6 (0)</p> <p>0 (6)</p> <p>0 (7)</p> <p>59 (4)</p> <p>7 (0)</p> <p>8</p> <p>SR-98</p>	<p>Clark Rd</p> <p>26 (2)</p> <p>0 (26)</p> <p>1 (40)</p> <p>9</p> <p>40 (2)</p> <p>SR-98</p>
<p>Pulliam Rd</p> <p>252 (15)</p> <p>13 (0)</p> <p>6 (252)</p> <p>0 (13)</p> <p>Project Access</p> <p>10</p> <p>Project Access</p> <p>Anza Rd</p>	<p>Brockman Rd</p> <p>13 (0)</p> <p>0 (13)</p> <p>11</p> <p>Anza Rd</p>	<p><b>LEGEND</b></p> <p>XX AM peak hour volumes at intersections</p> <p>YY PM peak hour volumes at intersections</p> <p>Z,ZZZ ADT volumes shown along segments</p> <p># Intersection Reference Number to LOS Tables</p> <p>Existing Roadways</p>

## **Appendix O**

### **Year 2012 + Cumulative Intersection LOS Calculations**

# AM 2012 + Cumulative

## 1: Evan Hewes Hwy & Dunaway Rd

HCM Unsignalized Intersection Capacity Analysis

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	EBT	EBR	WBL	WBT	NBL	NBR
Volume (veh/h)	14	40	242	33	26	111
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	15	43	263	36	28	121
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			59		599	37
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			59		599	37
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			83		93	88
cM capacity (veh/h)			1545		385	1035
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	59	299	149			
Volume Left	0	263	28			
Volume Right	43	0	121			
cSH	1700	1545	784			
Volume to Capacity	0.03	0.17	0.19			
Queue Length 95th (ft)	0	15	17			
Control Delay (s)	0.0	7.0	10.7			
Lane LOS		A	B			
Approach Delay (s)	0.0	7.0	10.7			
Approach LOS			B			
Intersection Summary						
Average Delay			7.3			
Intersection Capacity Utilization			36.8%		ICU Level of Service	A
Analysis Period (min)			15			

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Synchro 7 - Report

# AM 2012 + Cumulative

## 2: Project Access & Dunaway Rd

HCM Unsignalized Intersection Capacity Analysis

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	WBL	WBR	NBT	NBR	SBL	SBT
Volume (veh/h)	0	0	138	0	0	288
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	150	0	0	313
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	463	150			150	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	463	150			150	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			100	
cM capacity (veh/h)	557	896			1431	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	0	150	313			
Volume Left	0	0	0			
Volume Right	0	0	0			
cSH	1700	1700	1431			
Volume to Capacity	0.00	0.09	0.00			
Queue Length 95th (ft)	0	0	0			
Control Delay (s)	0.0	0.0	0.0			
Lane LOS	A					
Approach Delay (s)	0.0	0.0	0.0			
Approach LOS		A				
Intersection Summary						
Average Delay			0.0			
Intersection Capacity Utilization			18.5%		ICU Level of Service	A
Analysis Period (min)			15			

LOS Engineering, Inc.

Synchro 7 - Report

AM 2012 + Cumulative  
3: I-8 WB Ramp & Dunaway Rd

HCM Unsignalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	0	0	2	0	563	0	310	0	0	15	135
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	2	0	612	0	337	0	0	16	147
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)						2						
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	733	427	90	427	500	337	163			337		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	733	427	90	427	500	337	163			337		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	100	100	13	100			100		
cM capacity (veh/h)	44	520	968	538	473	705	1416			1222		
Direction, Lane #	WB 1	NB 1	SB 1									
Volume Total	614	337	163									
Volume Left	2	0	0									
Volume Right	612	0	147									
cSH	708	1416	1700									
Volume to Capacity	0.87	0.00	0.10									
Queue Length 95th (ft)	260	0	0									
Control Delay (s)	33.9	0.0	0.0									
Lane LOS	D											
Approach Delay (s)	33.9	0.0	0.0									
Approach LOS	D											
Intersection Summary												
Average Delay		18.7										
Intersection Capacity Utilization		57.8%			ICU Level of Service			B				
Analysis Period (min)		15										

AM 2012 + Cumulative  
4: I-8 EB Ramp & Dunaway Rd

HCM Unsignalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	306	1	0	0	0	0	0	0	1	18	3	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	333	1	0	0	0	0	0	0	1	20	3	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)						2						
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	43	43	3	43	43	1	3			1		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	43	43	3	43	43	1	3			1		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	65	100	100	100	100	100	100			99		
cM capacity (veh/h)	951	838	1081	949	839	1084	1619			1622		
Direction, Lane #	EB 1	NB 1	SB 1									
Volume Total	334	1	23									
Volume Left	333	0	20									
Volume Right	0	1	0									
cSH	949	1700	1622									
Volume to Capacity	0.35	0.00	0.01									
Queue Length 95th (ft)	40	0	1									
Control Delay (s)	10.8	0.0	6.2									
Lane LOS	B		A									
Approach Delay (s)	10.8	0.0	6.2									
Approach LOS	B											
Intersection Summary												
Average Delay		10.5										
Intersection Capacity Utilization		31.5%			ICU Level of Service			A				
Analysis Period (min)		15										

AM 2012 + Cumulative  
5: I-8 WB Ramp & Drew Rd

HCM Unsignalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	0	0	231	0	167	14	41	0	0	155	11
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	251	0	182	15	45	0	0	168	12
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)						2						
Median type							None				None	
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	340	249	174	249	255	45	180			45		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	340	249	174	249	255	45	180			45		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	64	100	82	99			100		
cM capacity (veh/h)	501	646	869	698	641	1025	1395			1564		
Direction, Lane #	WB 1	NB 1	SB 1									
Volume Total	433	60	180									
Volume Left	251	15	0									
Volume Right	182	0	12									
cSH	1203	1395	1700									
Volume to Capacity	0.36	0.01	0.11									
Queue Length 95th (ft)	41	1	0									
Control Delay (s)	11.4	2.0	0.0									
Lane LOS	B	A										
Approach Delay (s)	11.4	2.0	0.0									
Approach LOS	B											
Intersection Summary												
Average Delay			7.5									
Intersection Capacity Utilization			33.9%			ICU Level of Service			A			
Analysis Period (min)			15									

AM 2012 + Cumulative  
6: I-8 EB Ramp & Drew Rd

HCM Unsignalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	6	0	53	0	0	0	0	53	30	87	299	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	7	0	58	0	0	0	0	58	33	95	325	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)						2						
Median type							None				None	
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	588	604	325	617	588	74	325			90		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	588	604	325	617	588	74	325			90		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	98	100	92	100	100	100	100			94		
cM capacity (veh/h)	400	386	716	352	395	988	1235			1505		
Direction, Lane #	EB 1	NB 1	SB 1									
Volume Total	64	90	420									
Volume Left	7	0	95									
Volume Right	58	33	0									
cSH	797	1700	1505									
Volume to Capacity	0.08	0.05	0.06									
Queue Length 95th (ft)	7	0	5									
Control Delay (s)	10.8	0.0	2.2									
Lane LOS	B		A									
Approach Delay (s)	10.8	0.0	2.2									
Approach LOS	B											
Intersection Summary												
Average Delay			2.8									
Intersection Capacity Utilization			37.2%			ICU Level of Service			A			
Analysis Period (min)			15									

# AM 2012 + Cumulative

## 7: I-8 WB Ramp & Forrester Road

HCM Unsignalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	0	0	108	1	282	32	173	0	0	328	156
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	117	1	307	35	188	0	0	357	170
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)						2						
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	853	699	441	699	784	188	526			188		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	853	699	441	699	784	188	526			188		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	66	100	64	97			100		
cM capacity (veh/h)	174	352	616	345	314	854	1041			1386		
Direction, Lane #	WB 1	NB 1	SB 1									
Volume Total	425	223	526									
Volume Left	117	35	0									
Volume Right	307	0	170									
cSH	1184	1041	1700									
Volume to Capacity	0.36	0.03	0.31									
Queue Length 95th (ft)	41	3	0									
Control Delay (s)	14.1	1.6	0.0									
Lane LOS	B	A										
Approach Delay (s)	14.1	1.6	0.0									
Approach LOS	B											
Intersection Summary												
Average Delay			5.4									
Intersection Capacity Utilization			49.1%			ICU Level of Service				A		
Analysis Period (min)			15									

LOS Engineering, Inc.

Synchro 7 - Report

# AM 2012 + Cumulative

## 8: I-8 EB Ramp & Forrester Road

HCM Unsignalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	122	0	7	0	0	0	0	83	22	215	220	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	133	0	8	0	0	0	0	90	24	234	239	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)						2						
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	809	821	239	812	809	102	239			114		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	809	821	239	812	809	102	239			114		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	50	100	99	100	100	100	100			84		
cM capacity (veh/h)	263	260	800	259	265	953	1328			1475		
Direction, Lane #	EB 1	NB 1	SB 1									
Volume Total	140	114	473									
Volume Left	133	0	234									
Volume Right	8	24	0									
cSH	278	1700	1475									
Volume to Capacity	0.50	0.07	0.16									
Queue Length 95th (ft)	66	0	14									
Control Delay (s)	30.7	0.0	4.6									
Lane LOS	D		A									
Approach Delay (s)	30.7	0.0	4.6									
Approach LOS	D											
Intersection Summary												
Average Delay			8.9									
Intersection Capacity Utilization			43.6%			ICU Level of Service				A		
Analysis Period (min)			15									










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Synchro 7 - Report

PM 2012 + Cumulative

1: Evan Hewes Hwy & Dunaway Rd










HCM Unsignalized Intersection Capacity Analysis

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	27	14	178	13	40	357
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	29	15	193	14	43	388
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			45		438	37
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			45		438	37
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			88		91	63
cM capacity (veh/h)			1564		505	1035
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	45	208	432			
Volume Left	0	193	43			
Volume Right	15	0	388			
cSH	1700	1564	936			
Volume to Capacity	0.03	0.12	0.46			
Queue Length 95th (ft)	0	11	62			
Control Delay (s)	0.0	7.2	12.1			
Lane LOS		A	B			
Approach Delay (s)	0.0	7.2	12.1			
Approach LOS			B			
Intersection Summary						
Average Delay			9.8			
Intersection Capacity Utilization			48.2%	ICU Level of Service	A	
Analysis Period (min)			15			

PM 2012 + Cumulative

2: Project Access & Dunaway Rd

HCM Unsignalized Intersection Capacity Analysis

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	0	0	398	0	0	193
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	433	0	0	210
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	642	433			433	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	642	433			433	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			100	
cM capacity (veh/h)	438	623			1127	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	0	433	210			
Volume Left	0	0	0			
Volume Right	0	0	0			
cSH	1700	1700	1127			
Volume to Capacity	0.00	0.25	0.00			
Queue Length 95th (ft)	0	0	0			
Control Delay (s)	0.0	0.0	0.0			
Lane LOS	A					
Approach Delay (s)	0.0	0.0	0.0			
Approach LOS	A					
Intersection Summary						
Average Delay			0.0			
Intersection Capacity Utilization			24.3%	ICU Level of Service	A	
Analysis Period (min)			15			

# PM 2012 + Cumulative

## 3: I-8 WB Ramp & Dunaway Rd

HCM Unsignalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	0	0	1	3	4	0	245	0	0	554	174
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	1	3	4	0	266	0	0	602	189
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)						2						
Median type							None			None		
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	967	963	697	963	1058	266	791			266		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	967	963	697	963	1058	266	791			266		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	100	99	99	100			100		
cM capacity (veh/h)	230	256	441	235	225	772	829			1298		
Direction, Lane #	WB 1	NB 1	SB 1									
Volume Total	9	266	791									
Volume Left	1	0	0									
Volume Right	4	0	189									
cSH	455	829	1700									
Volume to Capacity	0.02	0.00	0.47									
Queue Length 95th (ft)	1	0	0									
Control Delay (s)	15.4	0.0	0.0									
Lane LOS	C											
Approach Delay (s)	15.4	0.0	0.0									
Approach LOS	C											
Intersection Summary												
Average Delay			0.1									
Intersection Capacity Utilization			49.7%			ICU Level of Service				A		
Analysis Period (min)			15									

# PM 2012 + Cumulative

## 4: I-8 EB Ramp & Dunaway Rd

HCM Unsignalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	245	0	3	0	0	0	0	0	6	555	1	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	266	0	3	0	0	0	0	0	7	603	1	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)						2						
Median type							None			None		
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1211	1214	1	1212	1211	3	1			7		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1211	1214	1	1212	1211	3	1			7		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	0	100	100	100	100	100	100			63		
cM capacity (veh/h)	113	114	1083	112	114	1081	1622			1614		
Direction, Lane #	EB 1	NB 1	SB 1									
Volume Total	270	7	604									
Volume Left	266	0	603									
Volume Right	3	7	0									
cSH	114	1700	1614									
Volume to Capacity	2.36	0.00	0.37									
Queue Length 95th (ft)	592	0	44									
Control Delay (s)	700.0	0.0	8.5									
Lane LOS	F		A									
Approach Delay (s)	700.0	0.0	8.5									
Approach LOS	F											
Intersection Summary												
Average Delay			220.2									
Intersection Capacity Utilization			57.7%			ICU Level of Service				B		
Analysis Period (min)			15									

PM 2012 + Cumulative  
5: I-8 WB Ramp & Drew Rd

HCM Unsignalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	0	0	21	0	102	62	82	0	0	173	19
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	23	0	111	67	89	0	0	188	21
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)						2						
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	478	422	198	422	433	89	209			89		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	478	422	198	422	433	89	209			89		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	96	100	89	95			100		
cM capacity (veh/h)	424	497	843	521	490	969	1362			1506		
Direction, Lane #	WB 1	NB 1	SB 1									
Volume Total	134	157	209									
Volume Left	23	67	0									
Volume Right	111	0	21									
cSH	1168	1362	1700									
Volume to Capacity	0.11	0.05	0.12									
Queue Length 95th (ft)	10	4	0									
Control Delay (s)	9.7	3.6	0.0									
Lane LOS	A	A										
Approach Delay (s)	9.7	3.6	0.0									
Approach LOS	A											
Intersection Summary												
Average Delay			3.7									
Intersection Capacity Utilization			31.3%			ICU Level of Service			A			
Analysis Period (min)			15									

PM 2012 + Cumulative  
6: I-8 EB Ramp & Drew Rd

HCM Unsignalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	9	1	24	0	0	0	0	124	241	136	62	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	10	1	26	0	0	0	0	135	262	148	67	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)						2						
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	629	760	67	642	629	266	67			397		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	629	760	67	642	629	266	67			397		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	97	100	97	100	100	100	100			87		
cM capacity (veh/h)	356	293	996	339	348	773	1534			1162		
Direction, Lane #	EB 1	NB 1	SB 1									
Volume Total	37	397	215									
Volume Left	10	0	148									
Volume Right	26	262	0									
cSH	1190	1700	1162									
Volume to Capacity	0.03	0.23	0.13									
Queue Length 95th (ft)	2	0	11									
Control Delay (s)	10.7	0.0	6.2									
Lane LOS	B		A									
Approach Delay (s)	10.7	0.0	6.2									
Approach LOS	B											
Intersection Summary												
Average Delay			2.7									
Intersection Capacity Utilization			45.4%			ICU Level of Service			A			
Analysis Period (min)			15									

PM 2012 + Cumulative

7: I-8 WB Ramp & Forrester Road

HCM Unsignalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	0	0	52	3	281	24	349	0	0	437	182
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	57	3	305	26	379	0	0	475	198
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)						2						
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1160	1005	574	1005	1104	379	673			379		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1160	1005	574	1005	1104	379	673			379		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	74	98	54	97			100		
cM capacity (veh/h)	90	234	518	215	205	668	918			1179		
Direction, Lane #	WB 1	NB 1	SB 1									
Volume Total	365	405	673									
Volume Left	57	26	0									
Volume Right	305	0	198									
cSH	798	918	1700									
Volume to Capacity	0.46	0.03	0.40									
Queue Length 95th (ft)	61	2	0									
Control Delay (s)	17.0	0.9	0.0									
Lane LOS	C	A										
Approach Delay (s)	17.0	0.9	0.0									
Approach LOS	C											
Intersection Summary												
Average Delay			4.6									
Intersection Capacity Utilization			48.1%			ICU Level of Service			A			
Analysis Period (min)			15									

PM 2012 + Cumulative

8: I-8 EB Ramp & Forrester Road

HCM Unsignalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	221	0	15	0	0	0	0	156	99	333	162	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	240	0	16	0	0	0	0	170	108	362	176	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)						2						
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1123	1177	176	1132	1123	223	176			277		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1123	1177	176	1132	1123	223	176			277		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	0	100	98	100	100	100	100			72		
cM capacity (veh/h)	143	137	867	139	148	816	1400			1286		
Direction, Lane #	EB 1	NB 1	SB 1									
Volume Total	257	277	538									
Volume Left	240	0	362									
Volume Right	16	108	0									
cSH	151	1700	1286									
Volume to Capacity	1.70	0.16	0.28									
Queue Length 95th (ft)	460	0	29									
Control Delay (s)	392.7	0.0	6.9									
Lane LOS	F		A									
Approach Delay (s)	392.7	0.0	6.9									
Approach LOS	F											
Intersection Summary												
Average Delay			97.4									
Intersection Capacity Utilization			63.5%			ICU Level of Service			B			
Analysis Period (min)			15									

## **Appendix P**

### **Year 2012 + Cumulative + Project Intersection LOS Calculations**

AM 2012 + Cumulative + Project  
1: Evan Hewes Hwy & Dunaway Rd

HCM Unsignalized Intersection Capacity Analysis

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↘			↘	↘	
Volume (veh/h)	14	40	272	33	26	112
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	15	43	296	36	28	122
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			59		664	37
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			59		664	37
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			81		92	88
cM capacity (veh/h)			1545		344	1035
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	59	332	150			
Volume Left	0	296	28			
Volume Right	43	0	122			
cSH	1700	1545	751			
Volume to Capacity	0.03	0.19	0.20			
Queue Length 95th (ft)	0	18	19			
Control Delay (s)	0.0	7.2	11.0			
Lane LOS		A	B			
Approach Delay (s)	0.0	7.2	11.0			
Approach LOS		B				
Intersection Summary						
Average Delay		7.5				
Intersection Capacity Utilization		38.5%		ICU Level of Service	A	
Analysis Period (min)		15				

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AM 2012 + Cumulative + Project  
2: Project Access & Dunaway Rd

HCM Unsignalized Intersection Capacity Analysis

	↖	↗	↑	↘	↙	↓
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↖		↖			↖
Volume (veh/h)	5	1	138	270	30	288
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	5	1	150	293	33	313
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	675	297			443	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	675	297			443	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	99	100			97	
cM capacity (veh/h)	407	743			1117	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	7	443	346			
Volume Left	5	0	33			
Volume Right	1	293	0			
cSH	440	1700	1117			
Volume to Capacity	0.01	0.26	0.03			
Queue Length 95th (ft)	1	0	2			
Control Delay (s)	13.3	0.0	1.1			
Lane LOS	B		A			
Approach Delay (s)	13.3	0.0	1.1			
Approach LOS	B					
Intersection Summary						
Average Delay		0.6				
Intersection Capacity Utilization		50.1%		ICU Level of Service	A	
Analysis Period (min)		15				

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### AM 2012 + Cumulative + Project

#### 3: I-8 WB Ramp & Dunaway Rd

HCM Unsignalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	0	0	2	0	788	0	355	0	0	19	136
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	2	0	857	0	386	0	0	21	148
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)						2						
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	909	480	95	480	554	386	168			386		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	909	480	95	480	554	386	168			386		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	0	100	100	100	100	0	100			100		
cM capacity (veh/h)	0	485	962	496	440	662	1409			1173		
Direction, Lane #	WB 1	NB 1	SB 1									
Volume Total	859	386	168									
Volume Left	2	0	0									
Volume Right	857	0	148									
cSH	664	1409	1700									
Volume to Capacity	1.29	0.00	0.10									
Queue Length 95th (ft)	847	0	0									
Control Delay (s)	163.0	0.0	0.0									
Lane LOS	F											
Approach Delay (s)	163.0	0.0	0.0									
Approach LOS	F											
Intersection Summary												
Average Delay			99.1									
Intersection Capacity Utilization			74.1%			ICU Level of Service				D		
Analysis Period (min)			15									

### AM 2012 + Cumulative + Project

#### 4: I-8 EB Ramp & Dunaway Rd

HCM Unsignalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	351	1	0	0	0	0	0	0	1	22	3	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	382	1	0	0	0	0	0	0	1	24	3	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)						2						
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	52	52	3	52	52	1	3			1		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	52	52	3	52	52	1	3			1		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	59	100	100	100	100	100	100			99		
cM capacity (veh/h)	937	827	1081	935	827	1084	1619			1622		
Direction, Lane #	EB 1	NB 1	SB 1									
Volume Total	383	1	27									
Volume Left	382	0	24									
Volume Right	0	1	0									
cSH	935	1700	1622									
Volume to Capacity	0.41	0.00	0.01									
Queue Length 95th (ft)	50	0	1									
Control Delay (s)	11.5	0.0	6.4									
Lane LOS	B		A									
Approach Delay (s)	11.5	0.0	6.4									
Approach LOS	B											
Intersection Summary												
Average Delay			11.1									
Intersection Capacity Utilization			34.2%			ICU Level of Service				A		
Analysis Period (min)			15									

AM 2012 + Cumulative + Project  
5: I-8 WB Ramp & Drew Rd

HCM Unsignalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	0	0	231	0	167	44	42	0	0	155	41
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	251	0	182	48	46	0	0	168	45
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)						2						
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	423	332	191	332	354	46	213			46		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	423	332	191	332	354	46	213			46		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	58	100	82	96			100		
cM capacity (veh/h)	433	567	851	605	551	1024	1357			1562		
Direction, Lane #	WB 1	NB 1	SB 1									
Volume Total	433	93	213									
Volume Left	251	48	0									
Volume Right	182	0	45									
cSH	1042	1357	1700									
Volume to Capacity	0.42	0.04	0.13									
Queue Length 95th (ft)	52	3	0									
Control Delay (s)	12.7	4.1	0.0									
Lane LOS	B	A										
Approach Delay (s)	12.7	4.1	0.0									
Approach LOS	B											
Intersection Summary												
Average Delay			7.9									
Intersection Capacity Utilization			38.1%			ICU Level of Service			A			
Analysis Period (min)			15									

AM 2012 + Cumulative + Project  
6: I-8 EB Ramp & Drew Rd

HCM Unsignalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	7	0	54	0	0	0	0	83	30	87	299	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	8	0	59	0	0	0	0	90	33	95	325	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)						2						
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	621	637	325	650	621	107	325			123		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	621	637	325	650	621	107	325			123		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	98	100	92	100	100	100	100			94		
cM capacity (veh/h)	380	369	716	334	377	948	1235			1464		
Direction, Lane #	EB 1	NB 1	SB 1									
Volume Total	66	123	420									
Volume Left	8	0	95									
Volume Right	59	33	0									
cSH	809	1700	1464									
Volume to Capacity	0.08	0.07	0.06									
Queue Length 95th (ft)	7	0	5									
Control Delay (s)	11.0	0.0	2.2									
Lane LOS	B		A									
Approach Delay (s)	11.0	0.0	2.2									
Approach LOS	B											
Intersection Summary												
Average Delay			2.7									
Intersection Capacity Utilization			37.2%			ICU Level of Service			A			
Analysis Period (min)			15									

AM 2012 + Cumulative + Project  
7: I-8 WB Ramp & Forrester Road

HCM Unsignalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	0	0	108	1	282	62	174	0	0	328	201
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	117	1	307	67	189	0	0	357	218
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)						2						
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	943	790	466	790	899	189	575			189		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	943	790	466	790	899	189	575			189		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	60	100	64	93			100		
cM capacity (veh/h)	147	301	597	292	260	853	998			1385		
Direction, Lane #	WB 1	NB 1	SB 1									
Volume Total	425	257	575									
Volume Left	117	67	0									
Volume Right	307	0	218									
cSH	1047	998	1700									
Volume to Capacity	0.41	0.07	0.34									
Queue Length 95th (ft)	50	5	0									
Control Delay (s)	15.5	2.8	0.0									
Lane LOS	C	A										
Approach Delay (s)	15.5	2.8	0.0									
Approach LOS	C											
Intersection Summary												
Average Delay			5.8									
Intersection Capacity Utilization			58.1%			ICU Level of Service			B			
Analysis Period (min)			15									

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AM 2012 + Cumulative + Project  
8: I-8 EB Ramp & Forrester Road

HCM Unsignalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	123	0	8	0	0	0	0	113	22	215	220	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	134	0	9	0	0	0	0	123	24	234	239	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)						2						
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	841	853	239	846	841	135	239			147		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	841	853	239	846	841	135	239			147		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	46	100	99	100	100	100	100			84		
cM capacity (veh/h)	249	248	800	244	252	914	1328			1435		
Direction, Lane #	EB 1	NB 1	SB 1									
Volume Total	142	147	473									
Volume Left	134	0	234									
Volume Right	9	24	0									
cSH	265	1700	1435									
Volume to Capacity	0.54	0.09	0.16									
Queue Length 95th (ft)	73	0	15									
Control Delay (s)	33.6	0.0	4.7									
Lane LOS	D		A									
Approach Delay (s)	33.6	0.0	4.7									
Approach LOS	D											
Intersection Summary												
Average Delay			9.2									
Intersection Capacity Utilization			47.6%			ICU Level of Service			A			
Analysis Period (min)			15									

LOS Engineering, Inc.

Synchro 7 - Report

PM 2012 + Cumulative + Project  
1: Evan Hewes Hwy & Dunaway Rd

HCM Unsignalized Intersection Capacity Analysis

	→	↖	↗	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↖			↖	↖	↖
Volume (veh/h)	27	14	179	13	40	387
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	29	15	195	14	43	421
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			45		440	37
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			45		440	37
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			88		91	59
cM capacity (veh/h)			1564		503	1035
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	45	209	464			
Volume Left	0	195	43			
Volume Right	15	0	421			
cSH	1700	1564	942			
Volume to Capacity	0.03	0.12	0.49			
Queue Length 95th (ft)	0	11	70			
Control Delay (s)	0.0	7.2	12.5			
Lane LOS		A	B			
Approach Delay (s)	0.0	7.2	12.5			
Approach LOS			B			
Intersection Summary						
Average Delay		10.2				
Intersection Capacity Utilization		50.1%		ICU Level of Service	A	
Analysis Period (min)		15				

LOS Engineering, Inc.

Synchro 7 - Report

PM 2012 + Cumulative + Project  
2: Project Access & Dunaway Rd

HCM Unsignalized Intersection Capacity Analysis

	↖	↗	↑	↖	↗	↓
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↖		↖			↖
Volume (veh/h)	270	30	398	14	1	193
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	293	33	433	15	1	210
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	652	440			448	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	652	440			448	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	32	95			100	
cM capacity (veh/h)	432	617			1112	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	326	448	211			
Volume Left	293	0	1			
Volume Right	33	15	0			
cSH	445	1700	1112			
Volume to Capacity	0.73	0.26	0.00			
Queue Length 95th (ft)	147	0	0			
Control Delay (s)	32.2	0.0	0.1			
Lane LOS	D		A			
Approach Delay (s)	32.2	0.0	0.1			
Approach LOS	D					
Intersection Summary						
Average Delay		10.7				
Intersection Capacity Utilization		45.2%		ICU Level of Service	A	
Analysis Period (min)		15				

LOS Engineering, Inc.

Synchro 7 - Report

### PM 2012 + Cumulative + Project

#### 3: I-8 WB Ramp & Dunaway Rd

HCM Unsignalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	0	0	1	3	16	0	247	0	0	779	219
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	1	7	17	0	268	0	0	847	238
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)						2						
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1246	1234	966	1234	1353	268	1085			268		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1246	1234	966	1234	1353	268	1085			268		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	99	96	98	100			100		
cM capacity (veh/h)	142	177	309	153	150	770	643			1295		
Direction, Lane #	WB 1	NB 1	SB 1									
Volume Total	25	268	1085									
Volume Left	1	0	0									
Volume Right	17	0	238									
cSH	494	643	1700									
Volume to Capacity	0.05	0.00	0.64									
Queue Length 95th (ft)	4	0	0									
Control Delay (s)	16.0	0.0	0.0									
Lane LOS	C											
Approach Delay (s)	16.0	0.0	0.0									
Approach LOS	C											
Intersection Summary												
Average Delay			0.3									
Intersection Capacity Utilization			64.3%			ICU Level of Service				C		
Analysis Period (min)			15									

### PM 2012 + Cumulative + Project

#### 4: I-8 EB Ramp & Dunaway Rd

HCM Unsignalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	247	0	3	0	0	0	0	0	6	780	1	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	268	0	3	0	0	0	0	0	7	848	1	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)						2						
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1700	1703	1	1702	1700	3	1			7		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1700	1703	1	1702	1700	3	1			7		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	0	100	100	100	100	100	100			47		
cM capacity (veh/h)	43	43	1083	42	44	1081	1622			1614		
Direction, Lane #	EB 1	NB 1	SB 1									
Volume Total	272	7	849									
Volume Left	268	0	848									
Volume Right	3	7	0									
cSH	43	1700	1614									
Volume to Capacity	6.31	0.00	0.53									
Queue Length 95th (ft)	Err	0	80									
Control Delay (s)	Err	0.0	9.7									
Lane LOS	F		A									
Approach Delay (s)	Err	0.0	9.7									
Approach LOS	F											
Intersection Summary												
Average Delay			2417.8									
Intersection Capacity Utilization			70.3%			ICU Level of Service				C		
Analysis Period (min)			15									

PM 2012 + Cumulative + Project  
5: I-8 WB Ramp & Drew Rd

HCM Unsignalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	0	0	21	0	102	63	112	0	0	173	20
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	23	0	111	68	122	0	0	188	22
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)						2						
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	513	458	199	458	468	122	210			122		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	513	458	199	458	468	122	210			122		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	95	100	88	95			100		
cM capacity (veh/h)	399	474	842	494	468	929	1361			1466		
Direction, Lane #	WB 1	NB 1	SB 1									
Volume Total	134	190	210									
Volume Left	23	68	0									
Volume Right	111	0	22									
cSH	1121	1361	1700									
Volume to Capacity	0.12	0.05	0.12									
Queue Length 95th (ft)	10	4	0									
Control Delay (s)	10.0	3.1	0.0									
Lane LOS	A	A										
Approach Delay (s)	10.0	3.1	0.0									
Approach LOS	A											
Intersection Summary												
Average Delay			3.6									
Intersection Capacity Utilization			33.0%			ICU Level of Service			A			
Analysis Period (min)			15									

LOS Engineering, Inc.

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6: I-8 EB Ramp & Drew Rd

HCM Unsignalized Intersection Capacity Analysis

















Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	39	1	54	0	0	0	0	125	241	136	62	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	42	1	59	0	0	0	0	136	262	148	67	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)						2						
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	630	761	67	660	630	267	67			398		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	630	761	67	660	630	267	67			398		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	88	100	94	100	100	100	100			87		
cM capacity (veh/h)	356	292	996	319	348	772	1534			1161		
Direction, Lane #	EB 1	NB 1	SB 1									
Volume Total	102	398	215									
Volume Left	42	0	148									
Volume Right	59	262	0									
cSH	832	1700	1161									
Volume to Capacity	0.12	0.23	0.13									
Queue Length 95th (ft)	10	0	11									
Control Delay (s)	12.1	0.0	6.2									
Lane LOS	B		A									
Approach Delay (s)	12.1	0.0	6.2									
Approach LOS	B											
Intersection Summary												
Average Delay			3.6									
Intersection Capacity Utilization			45.5%			ICU Level of Service			A			
Analysis Period (min)			15									

LOS Engineering, Inc.

Synchro 7 - Report

PM 2012 + Cumulative + Project  
7: I-8 WB Ramp & Forrester Road

HCM Unsignalized Intersection Capacity Analysis

















												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	0	0	52	3	281	25	394	0	0	437	184
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	57	3	305	27	428	0	0	475	200
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)						2						
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1212	1058	575	1058	1158	428	675			428		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1212	1058	575	1058	1158	428	675			428		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	71	98	51	97			100		
cM capacity (veh/h)	79	218	518	198	190	627	916			1131		
Direction, Lane #	WB 1	NB 1	SB 1									
Volume Total	365	455	675									
Volume Left	57	27	0									
Volume Right	305	0	200									
cSH	749	916	1700									
Volume to Capacity	0.49	0.03	0.40									
Queue Length 95th (ft)	68	2	0									
Control Delay (s)	18.5	0.9	0.0									
Lane LOS	C	A										
Approach Delay (s)	18.5	0.9	0.0									
Approach LOS	C											
Intersection Summary												
Average Delay		4.8										
Intersection Capacity Utilization		51.2%		ICU Level of Service					A			
Analysis Period (min)		15										

LOS Engineering, Inc.

Synchro 7 - Report

PM 2012 + Cumulative + Project  
8: I-8 EB Ramp & Forrester Road

HCM Unsignalized Intersection Capacity Analysis

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	266	0	45	0	0	0	0	157	99	333	162	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	289	0	49	0	0	0	0	171	108	362	176	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)			2									
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1124	1178	176	1149	1124	224	176			278		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1124	1178	176	1149	1124	224	176			278		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	0	100	94	100	100	100	100			72		
cM capacity (veh/h)	143	137	867	130	147	815	1400			1284		
Direction, Lane #	EB 1	NB 1	SB 1									
Volume Total	338	278	538									
Volume Left	289	0	362									
Volume Right	49	108	0									
cSH	163	1700	1284									
Volume to Capacity	2.08	0.16	0.28									
Queue Length 95th (ft)	667	0	29									
Control Delay (s)	552.5	0.0	6.9									
Lane LOS	F		A									
Approach Delay (s)	552.5	0.0	6.9									
Approach LOS	F											
Intersection Summary												
Average Delay		165.0										
Intersection Capacity Utilization		66.0%		ICU Level of Service	C							
Analysis Period (min)		15										

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## **Appendix Q**

### **.Excerpt from the Imperial County Circulation Element Update and 2030 Calculations**

**TABLE 3**  
**IMPERIAL COUNTY PROJECTED STREET SEGMENT CONFIGURATIONS AND**  
**VOLUMES**

Segment Location	2003 Classification	Year 2002 ADT Volume <sup>a</sup>	Year 2005 ADT Volume <sup>a</sup>	Year 2025 ADT Volume <sup>c</sup>	25 Year Total Growth Factor <sup>d</sup>	Year 2050 ADT Volume	Year 2050 Recommended Classification (# of Lanes)	2050 LOS <sup>e</sup>
<b>Alamo Road</b>								
Meloland/SR-115	Major Collector						Major Collector (4)	
<b>Albright Road</b>								
SR-111/SR-115	Minor Collector						Minor Collector (2)	
SR-115/Butters	Major Collector						Major Collector (4)	
<b>Anderholt Road</b>								
Evan Hewes (S-80)/Hunt	Minor Collector						Minor Collector (2)	
Hunt/Carr	Major Collector						Major Collector (4)	
<b>Andre Road</b>								
Forrester/End	Minor Collector						Minor Collector (2)	
<b>Anza Road</b>								
Pulliam/Rockwood	Local						Minor Collector (2)	
Rockwood/Calexico	Prime Arterial						Prime Arterial (6-divided)	
Calexico/Barbara Worth	Prime Arterial						Prime Arterial (6-divided)	
<b>Aten Road</b>								
End/Forrester	Minor Collector						Minor Collector (2)	
Forrester/Austin	Minor Arterial						Minor Arterial (6-divided)	
East Imperial City Limits/Dogwood	Prime Arterial	7,300	8,450	39,000	1.13	44,500	Prime Arterial (6-divided)	C
Dogwood/SR-111	Prime Arterial						Prime Arterial (6-divided)	
Proposed/SR-111/River	None						Prime Arterial (6-divided)	
<b>Austin Road</b>								
McCabe/Wahl	Local						Prime Arterial (6-divided)	
Proposed Wahl/SR-98	None						Prime Arterial (6-divided)	
Evan Hewes Hwy/McCabe	Major Collector						Prime Arterial (6-divided)	
Aten/Evan Hewes Hwy	Minor Arterial						Prime Arterial (6-divided)	
Keystone/Aten	Major Collector						Prime Arterial (6-divided)	
SR-86/Keystone	Minor Collector						Prime Arterial (6-divided)	
<b>Bannister Road</b>								
SR-86/Brandt	Major Collector						Major Collector (4)	
<b>Barbara Worth Road</b>								
Zenos/Evan Hewes (S-80)	Minor Collector						Major Collector (4)	
Evan Hewes Hwy/Anza	Major Collector						Major Collector (4)	
<b>Baughman Road</b>								
Garvey/Lack	Minor Collector						Minor Collector (2)	
Lack/SR-86	Major Collector						Major Collector (4)	
<b>Bell Road</b>								
Alamo/Evan Hewes Hwy	Minor Collector						Minor Collector (2)	
<b>Bennett Road</b>								
Havens/Ross	Minor Collector						Minor Collector (2)	
<b>Best Road</b>								
Rutherford/Brawley	Minor Arterial						Minor Arterial (4)	
<b>Blair Road</b>								
Pound/Sinclair	Minor Collector						Minor Collector (2)	
Peterson/Lindsey	Major Collector						Major Collector (4)	
Lindsey/SR-115	Major Collector						Major Collector (4)	
SR-115/Yocum	Local						Major Collector (4)	
<b>Blais Road</b>								
Wieman/Forrester	Minor Collector						Minor Collector	
<b>Boarts Road (S26)</b>								
Westmorland/Kalin	Major Collector						Major Collector (4)	
<b>Boley Road</b>								
Westmorland/Huff	Minor Collector						Minor Collector (2)	
<b>Bonds Corner Road</b>								
Holtville/I-8	Major Collector						Major Collector (4)	
I-8/SR-98	Minor Arterial						Minor Arterial (4)	
<b>Bonesteel Road</b>								
Kumberg/SR-98	Minor Collector						Minor Collector (2)	
<b>Bornt Road</b>								
Verde School/SR-98	Minor Collector						Minor Collector (2)	
<b>Bowker Road</b>								
Evan Hewes Hwy/I-8	Major Collector						Major Collector (4)	
I-8/SR-98	Minor Arterial						Expressway (6)	
SR-98/Anza	None						Minor Arterial (4)	

**TABLE 3**  
**IMPERIAL COUNTY PROJECTED STREET SEGMENT CONFIGURATIONS AND**  
**VOLUMES (continued)**

Segment Location	2003 Classification	Year 2002 ADT Volume <sup>a</sup>	Year 2005 ADT Volume <sup>a</sup>	Year 2025 ADT Volume <sup>c</sup>	25 Year Total Growth Factor <sup>d</sup>	Year 2050 ADT Volume	Year 2050 Recommended Classification (# of Lanes)	2050 LOS <sup>e</sup>
<b>Bowles Road</b>								
Riley/Lyerly	Minor Collector						Minor Collector (2)	
<b>Boyd Road</b>								
Wiest/SR-78	Local						Minor Collector (2)	
SR-115/Highline	Local						Minor Collector (2)	
Highline/End	Minor Collector						Minor Collector (2)	
<b>Brandt Road</b>								
Sinclair/Lindsey	Local						Minor Collector (2)	
Lindsey/Eddins	Minor Collector						Minor Collector (2)	
Eddins/Webster	Minor Collector						Minor Collector (2)	
<b>Bridenstein Road</b>								
Proposed SR-78/Hartshorn							Minor Collector (2)	
Hartshorn/Bonds Corner	Minor Collector						Minor Collector (2)	
<b>Brockman Road (S30)</b>								
McCabe/SR-98	Major Collector						Major Collector (4)	
<b>Butters Road (S32)</b>								
Gonder/SR-78	Prime Arterial						Prime Arterial (6)	A
Bowles/Albright	Local						Major Collector (4)	
Albright/SR-78	Major Collector						Major Collector (4)	
<b>Cady Road</b>								
Pellet/SR-86	Major Collector						Major Collector (4)	
<b>Cambell Road</b>								
Jessup/Derrick	Major Collector						Major Collector (4)	
Derrick/Drew	Major Collector						Major Collector (4)	
<b>Carey Road</b>								
SR-86/Dogwood	Minor Collector						Minor Collector (2)	
<b>Carr Road</b>								
Barbara Worth/SR-7	Major Collector						Minor Arterial (4)	
<b>Carter Road</b>								
Kalin/Forrester	Minor Collector						Major Collector (4)	
<b>Casey Road</b>								
Dickerman/SR-78	Minor Collector						Minor Collector (2)	
SR-78/Worthington	Minor Collector						Major Collector (4)	
Proposed Worthington/Norrish	None						Major Collector (4)	
<b>Chick Road</b>								
El Centro/Pitzer	Prime Arterial						Prime Arterial (6)	
Pitzer/Barbara Worth	Major Collector						Major Collector (4)	
<b>Clark Road</b>								
El Centro/SR-98	Minor Arterial						Minor Arterial (4)	
North El Centro City Limits/Worthington	Major Collector	2,100	2,430	12,550	1.64	21,000	Major Collector (4)	B
Worthington/Larsen	Minor Collector	800	930	6,220	1.64	10,500	Major Collector (4)	A
<b>Cole Road</b>								
Dogwood/Calexico	Prime Arterial						Prime Arterial (6-divided)	
East Calexico City Limits/SR-98	Minor Arterial	9,700	11,230	18,340	1.64	30,500	Prime Arterial (6-divided)	B
<b>Connelly Road</b>								
Vencill/Van Der Linden	Minor Collector						Minor Collector (2)	
<b>Cooley Road</b>								
Worthington/Gillett	Minor Collector						Minor Collector (2)	
<b>Corn Road</b>								
Bowles/Eddins	Minor Collector						Minor Collector (2)	
<b>Correll Road</b>								
Dogwood/SR 111	Minor Arterial						Minor Arterial (4)	
<b>Cross Road</b>								
Imperial (City)/Villa	Minor Collector						Minor Collector (2)	
<b>Davis Road</b>								
Gillespie/Schrimp	Major Collector						Major Collector (4)	
Proposed Schrimp/Sinclair	Major Collector						Major Collector (4)	
<b>Dearborn Road</b>								
Harrigan/Wormwood	Minor Collector						Minor Collector (2)	
<b>Derrick Road</b>								
Evan Hewes Hwy/Wixom	Minor Collector						Minor Collector (2)	
<b>Dickerman Road</b>								
SR-115/Butters	Minor Collector						Minor Collector (2)	

**TABLE 3**  
**IMPERIAL COUNTY PROJECTED STREET SEGMENT CONFIGURATIONS AND**  
**VOLUMES (continued)**

Segment Location	2003 Classification	Year 2002 ADT Volume <sup>a</sup>	Year 2005 ADT Volume <sup>a</sup>	Year 2025 ADT Volume <sup>c</sup>	25 Year Total Growth Factor <sup>d</sup>	Year 2050 ADT Volume	Year 2050 Recommended Classification (# of Lanes)	2050 LOS <sup>e</sup>
<b>Diehl Road</b>								
Westside/Drew	Minor Collector						Minor Collector (2)	
Drew/Harrigan	Major Collector						Prime Arterial (6)	
Proposed Harrigan/Silsbee	Major Collector						Prime Arterial (6)	
<b>Dietrich Road</b>								
Rutherford/Shank	Minor Collector						Major Collector (4)	
Proposed Shank/SR-78	None						Major Collector (4)	
<b>Doetsch Road</b>								
Elder/SR-86	Minor Collector						Minor Collector (2)	
<b>Dogwood Road (S31)*</b>								
Proposed Lindsey/Hovley	None						Prime Arterial (6-divided)	
Brawley/SR-98	Prime Arterial						Prime Arterial (6-divided)	
<b>Dowden Road</b>								
Proposed Forrester/Gentry	None						Local Collector (2)	
Gentry/Kershaw	None						Prime Arterial (6)	
Kershaw/Butters	Minor Collector						Prime Arterial (6)	
<b>Drew Road (S29)</b>								
Evan Hewes/SR-98	Prime Arterial						Prime Arterial (6-divided)	
<b>Dunaway Road</b>								
I-8/Evan Hewes Hwy	Major Collector	900	1,040	2,756	1.64	4,500	Major Collector (4)	A
<b>Eady Road</b>								
Willoughby/Cole	Minor Collector						Minor Collector (2)	
<b>Eddins Road (S30)</b>								
Gentry/SR-111(Calipatria City Limits)	Major Collector						Major Collector (4)	
<b>Edgar Road</b>								
Pierle/Forrester	Minor Collector						Minor Collector (2)	
<b>Elder Road</b>								
Doetsch/Cady	Minor Collector						Minor Collector (2)	
<b>English Road</b>								
Sinclair/Wilkins	Minor Collector						Minor Collector (2)	
<b>Erskine Road</b>								
Wheeler/Payne	Minor Collector						Minor Collector	
<b>Evan Hewes Hwy (S80)</b>								
Imperial Hwy/El Centro	Prime Arterial						Prime Arterial (6-divided)	
El Centro/SR-115	Prime Arterial						Prime Arterial (6-divided)	
SR-115/End	Prime Arterial						Prime Arterial (6-divided)	
<b>Fawcett Road</b>								
Dogwood/Meadows	Minor Collector						Major Collector (4)	
<b>Ferrell Road</b>								
Kubler/SR-98	Major Collector						Major Collector (4)	
SR-98/Anza	Minor Collector						Minor Collector (2)	
<b>Fiffield Road</b>								
SR-78/Streiby	Minor Collector						Minor Collector (2)	
<b>Fisher Road</b>								
Drew/Pulliam	Minor Collector						Minor Collector (2)	
<b>Flett Road</b>								
Wilkinson/Wirt	Minor Collector						Minor Collector (2)	
<b>Forrester Road (S30)</b>								
Proposed Sinclair/Walker	None						Prime Arterial (6-divided)	
Walker/Westmorland	Major Collector						Prime Arterial (6-divided)	
Westmorland/McCabe	Prime Arterial						Prime Arterial (6-divided)	
McCabe/Hime	Minor Collector						Prime Arterial (6-divided)	
Proposed Hime/River	Minor Collector						Prime Arterial (6-divided)	
North Westmorland City Limits/Gentry	Major Collector	1,200	1,390	9,000	1.64	15,000	Prime Arterial (6-divided)	A
<b>Foulds Road</b>								
Pellet/Lack	Minor Collector						Minor Collector (2)	
<b>Fredericks Road</b>								
Loveland/SR-111	Minor Collector						Minor Collector (2)	
<b>Frontage Road</b>								
Ross/Brawley (City)	Major Collector						Major Collector (4)	
<b>Garst Road</b>								
Sinclair/McDonald	Minor Collector						Minor Collector (2)	
<b>Garvey Road</b>								
Baughman/Andre	Minor Collector						Minor Collector (2)	

**TABLE 3**  
**IMPERIAL COUNTY PROJECTED STREET SEGMENT CONFIGURATIONS AND**  
**VOLUMES (continued)**

Segment Location	2003 Classification	Year 2002 ADT Volume <sup>a</sup>	Year 2005 ADT Volume <sup>a</sup>	Year 2025 ADT Volume <sup>c</sup>	25 Year Total Growth Factor <sup>d</sup>	Year 2050 ADT Volume	Year 2050 Recommended Classification (# of Lanes)	2050 LOS <sup>e</sup>
<b>Gentry Road</b>								
Sinclair/Walker	Major Collector						Major Collector (4)	
<b>Gillespie Road</b>								
Davis/Wilkins	Minor Collector						Minor Collector (2)	
<b>Gillett Road</b>								
Cooley/Bowker	Minor Collector						Minor Collector (2)	
<b>Gonder Road</b>								
Proposed New River/SR-115	None						Major Collector (4)	
SR-115/Butters	Local						Minor Collector (2)	
Butters/Green	Minor Collector						Minor Collector (2)	
Green/Highline	Major Collector						Major Collector (4)	
<b>Gowling Road</b>								
Norrish/Zenos	Minor Collector						Major Collector (4)	
<b>Green Road</b>								
SR-78/Gonder	Major Collector						Major Collector (4)	
<b>Griffin Road</b>								
Wiest/SR-115	Minor Collector						Minor Collector (2)	
<b>Grumbles Road</b>								
James/Meloland	Minor Collector						Minor Collector (2)	
<b>Gullett Road</b>								
Worthington/Aten	Minor Collector						Minor Collector (2)	
<b>Gutherie Road</b>								
Wiener/Worthington	Minor Collector						Minor Collector (2)	
Proposed Worthington/Hackleman	Minor Collector						Minor Collector (2)	
<b>Hackleman Road</b>								
Low/Forrester	Minor Collector						Minor Collector (2)	
<b>Hardy Road</b>								
Dunaway/Jeffrey	Major Collector						Major Collector (4)	
Jeffrey/Hyde	Major Collector						Major Collector (4)	
Hyde/Jessup	Major Collector						Major Collector (4)	
<b>Harrigan Road</b>								
Diehl/Dearborn	Minor Collector						Minor Collector (2)	
<b>Harris Road</b>								
Austin/SR-86	Local						Major Collector (4)	
SR-86/McConnel	Major Collector						Major Collector (4)	
McConnell/Highline	Minor Collector						Major Collector (4)	
<b>Hart Road</b>								
Wiest/SR-115	Minor Collector						Minor Collector (2)	
<b>Hartshorn Road</b>								
Bridenstein/Proposed Bridenstein	Minor Collector						Minor Collector	
<b>Haskell Road</b>								
Evan Hewes Hwy/End	Minor Collector						Minor Collector (2)	
<b>Hastain Road</b>								
Taecker/SR-78	Minor Collector						Minor Collector (2)	
Young/Dickerman	Minor Collector						Minor Collector (2)	
<b>Havens Road</b>								
Haskell/Bennett	Minor Collector						Minor Collector (2)	
<b>Hetzel Road</b>								
Westmorland/Huff	Minor Collector						Minor Collector (2)	
<b>Heber Road</b>								
La Brucherie/SR-86	Local						Minor Collector (2)	
SR-111/Anderholt	Minor Arterial	N/A	2,040	16,700	1.64	27,500	Prime Arterial (6-divided)	B
Anderholt/Keffer	Major Collector						Major Collector (4)	
Keffer/Vencill	Minor Collector						Major Collector (4)	
<b>Highline Road (S33)</b>								
Proposed SR-78/Gonder	None						Major Collector (4)	
Gonder/Kavanaugh	Major Collector						Major Collector (4)	
Proposed Kavanaugh/I-8	None						Major Collector (4)	
<b>Holt Road, (S32)</b>								
Gonder/Holtville city limits	Prime Arterial						Prime Arterial (6-divided)	
<b>Hoskins Road</b>								
SR-86/Steiner	Minor Collector						Minor Collector	
<b>Hovley Road</b>								
Rutherford/Brawley	Major Collector						Major Collector (4)	

**TABLE 3**  
**IMPERIAL COUNTY PROJECTED STREET SEGMENT CONFIGURATIONS AND**  
**VOLUMES (continued)**

Segment Location	2003 Classification	Year 2002 ADT Volume <sup>a</sup>	Year 2005 ADT Volume <sup>a</sup>	Year 2025 ADT Volume <sup>c</sup>	25 Year Total Growth Factor <sup>d</sup>	Year 2050 ADT Volume	Year 2050 Recommended Classification (# of Lanes)	2050 LOS <sup>e</sup>
<b>Huff Road</b>								
Imler/Evan Hewes Hwy	Major Collector						Major Collector (4)	
<b>Hunt Road</b>								
Barbara Worth/Bonds Corner	Major Collector						Major Collector (4)	
Bonds Corner/Van Der Linden	Minor Collector						Minor Collector (2)	
<b>Huston Road</b>								
Dogwood/McConnell	Minor Collector						Minor Collector (2)	
<b>Imler Road</b>								
Huff/Forrester	Major Collector						Major Collector (4)	
<b>International Road</b>								
Noffsinger/Pound	Minor Collector						Minor Collector (2)	
<b>Irvine Road</b>								
Shank/End	Minor Collector						Minor Collector (2)	
<b>James Road</b>								
Ralph/Evan Hewes Hwy	Minor Collector						Minor Collector (2)	
<b>Jasper Road</b>								
Calexico/Anderholt	Major Collector						Expressway (6)	
Proposed Anderholt/ SR-7	None						Expressway (6)	
<b>Jeffery Road</b>								
Evan Hewes Hwy/Hardy	Minor Collector						Minor Collector (2)	
<b>Kaiser Road</b>								
Wirt/Albright	Minor Collector						Minor Collector (2)	
<b>Kalin (S26)</b>								
Sinclair/SR-78/86	Major Collector						Major Collector (4)	
SR-78/86/Webster	Minor Collector						Minor Collector (4)	
<b>Kamm Road</b>								
River/SR-115	Local						Prime Arterial (6)	
SR-115/Holt	Minor Collector						Major Collector (4)	
<b>Keffer Road</b>								
SR-98/King	Major Collector						Major Collector (4)	
<b>Kershaw Road</b>								
Yocum/Rutherford	Minor Collector						Minor Collector (2)	
<b>Keystone Road (S27)</b>								
Forrester/SR-111	Prime Arterial						Expressway (6)	
SR-111/Highline	Major Collector						Expressway (6)	
<b>King Road</b>								
Orchard/Keffer	Major Collector						Major Collector (4)	
<b>Kloke Road</b>								
Willoughby/Calexico	Major Collector						Major Collector (4)	
<b>Kramar Road</b>								
Drew/Forrester	Major Collector						Major Collector (4)	
<b>Kubler Road</b>								
Drew/Clark	Minor Collector						Minor Collector (2)	
<b>Kumborg Road</b>								
Bonesteel/Miller	Minor Collector						Minor Collector (2)	
<b>La Brucherie Road</b>								
El Centro city limits/Kubler	Major Collector						Major Collector (4)	
Larsen/Murphy	Minor Collector						Minor Collector (2)	
Murphy/Imperial city limits	Minor Collector						Minor Collector (2)	
<b>Lack Road</b>								
Lindsey/Blais	Minor Collector						Minor Collector (2)	
<b>Larsen Road</b>								
Forrester/SR-86	Major Collector						Major Collector (4)	
SR-86/Clark	Minor Collector						Minor Collector (2)	
<b>Lavigne Road</b>								
SR-98/Bowker	Prime Arterial						Prime Arterial (6)	
Proposed Bowker/Barbara Worth	Prime Arterial						Prime Arterial (6)	
<b>Liebert Road</b>								
Wixom/Rd 8018	Minor Collector						Minor Collector (2)	
Proposed Road 8018/SR-98	Minor Collector						Minor Collector (2)	
<b>Lindsey Road</b>								
Lack/Wiest	Minor Collector						Minor Collector (2)	
<b>Loveland Road</b>								
Fredericks/Monte	Minor Collector						Minor Collector (2)	
<b>Low Road</b>								
Hackleman/Evan Hewes Hwy	Minor Collector						Minor Collector (2)	

**TABLE 3**  
**IMPERIAL COUNTY PROJECTED STREET SEGMENT CONFIGURATIONS AND**  
**VOLUMES (continued)**

Segment Location	2003 Classification	Year 2002 ADT Volume <sup>a</sup>	Year 2005 ADT Volume <sup>a</sup>	Year 2025 ADT Volume <sup>c</sup>	25 Year Total Growth Factor <sup>d</sup>	Year 2050 ADT Volume	Year 2050 Recommended Classification (# of Lanes)	2050 LOS <sup>e</sup>
<b>Lyerly Road</b>								
Bowles/Eddins	Minor Collector						Minor Collector (2)	
<b>Lyons Road</b>								
Drew/Nichols	Minor Collector						Major Collector (4)	
Proposed Nichols/La Brucherie	None						Major Collector (4)	
<b>Main ST (Niland)</b>								
SR-111/Blair	Major Collector						Major Collector (4)	
<b>Martin Road</b>								
Baughman/7th	Minor Collector						Minor Collector (2)	
7th/Bannister	Local						Minor Collector (2)	
<b>Mead Road</b>								
Dogwood/McConnell	Minor Collector						Minor Collector (2)	
<b>Meadows Road</b>								
Heber/Calexico (City)	Major Collector						Major Collector (4)	
<b>Meloland Road</b>								
Worthington/Correll	Minor Collector						Minor Collector (2)	
Proposed Correll/SR-98	Minor Collector						Minor Collector (2)	
<b>McCabe Road</b>								
Silsbee/La Brucherie	Major Collector						Prime Arterial (6-divided)	
La Brucherie/SR-111	Minor Arterial	N/A	200	17,270	1.64	28,500	Prime Arterial (6-divided)	B
SR-111/SR-7	Major Collector						Prime Arterial (6-divided)	
<b>McConnell Road</b>								
SR-78/Evan Hewes Hwy	Major Collector						Major Collector (4)	
<b>McDonald Road</b>								
Garst/SR-111	Minor Collector						Minor Collector (2)	
SR-111 TO Rd 8041	Minor Collector						Minor Collector (2)	
<b>McKim Road</b>								
Harris/Ralph	Minor Collector						Minor Collector (2)	
<b>Miller Road (S33)</b>								
I-8/Kumberg	Minor Collector						Minor Collector (2)	
I-8/SR-115	Major Collector	200	230	5,250	1.64	9,000	Major Collector (4)	A
SR-115/Kavanaugh	Major Collector	100	120	5,300	1.64	9,000	Major Collector (4)	A
<b>Monte Road</b>								
Pellet/Loveland	Minor Collector						Minor Collector (2)	
<b>Neckel Road</b>								
Austin/Clark	Minor Collector						Minor Collector (2)	
<b>Nichols Road</b>								
McCabe/Lyons	Minor Collector						Minor Collector (2)	
<b>Noffsinger Road</b>								
SR-111/McDonald	Minor Collector						Minor Collector (2)	
<b>Norrish Road</b>								
Gowling/Holt	Minor Collector						Minor Collector (2)	
Holt/Highline	Local						Major Collector (4)	
Highline/End	Major Collector						Major Collector (4)	
<b>Orchard Road (S32)/ SR 7</b>								
King/McCabe	Major Collector	700	810	50,740	1.13	57,500	Expressway (6)	C
McCabe/I-8	Major Collector	900	1,040	49,000	1.13	56,000	Expressway (6)	C
Holtville/I-8	Minor Arterial						Prime Arterial (6-divided)	
I-8/Connelly	Major Collector						Major Collector (4)	
<b>Orr Road</b>								
Baughman/SR-86	Minor Collector						Minor Collector (2)	
<b>Park Road</b>								
Proposed Dowden/Williams	None						Major Collector (4)	
Williams/Rutherford	Minor Collector						Major Collector (4)	
Proposed Rutherford/Dietrich	None						Major Collector (4)	
<b>Parker Road</b>								
Ross/Gilllett	Minor Collector						Minor Collector (2)	
<b>Payne Road</b>								
Huff/Erskine	Minor Collector						Minor Collector (2)	
<b>Pellet Road</b>								
Foulds/Monte	Minor Collector						Minor Collector (2)	
Proposed Monte/Imler	Minor Collector						Minor Collector (2)	
<b>Pickett Road</b>								
Hastain/Butters	Minor Collector						Minor Collector (2)	

**TABLE 3**  
**IMPERIAL COUNTY PROJECTED STREET SEGMENT CONFIGURATIONS AND**  
**VOLUMES (continued)**

Segment Location	2003 Classification	Year 2002 ADT Volume <sup>a</sup>	Year 2005 ADT Volume <sup>a</sup>	Year 2025 ADT Volume <sup>c</sup>	25 Year Total Growth Factor <sup>d</sup>	Year 2050 ADT Volume	Year 2050 Recommended Classification (# of Lanes)	2050 LOS <sup>e</sup>
<b>Pierle Road</b>								
Edgar/Wheeler	Minor Collector						Minor Collector (2)	
<b>Pitzer Road</b>								
Proposed Jasper/Willoughby	None						Major Collector (4)	
Chick/SR-86	Major Collector						Major Collector (4)	
SR-86/Jasper	Minor Collector						Major Collector (4)	
<b>Pound Road</b>								
Davis/International	Major Collector						Major Collector (4)	
International/Noffsinger	Minor Collector						Minor Collector (2)	
<b>Pulliam Road</b>								
Fisher/ SR-98	Minor Collector						Minor Collector (2)	
<b>Ralph Road</b>								
Imperial (City)/Dogwood	Major Collector						Major Collector (4)	
Dogwood/Mckim	Minor Collector						Minor Collector (2)	
<b>Riley Road</b>								
Bowles/Eddins	Minor Collector						Minor Collector	
<b>Rockwood Road</b>								
Proposed River/Lyons	Minor Collector						Prime Arterial (6)	
Lyons SR-98	Minor Collector						Prime Arterial (6)	
SR-98/Anza	Major Collector						Major Collector	
<b>Ross Road</b>								
Drew/Bennett	Major Collector	1,500	1,740	2,310	1.64	4,000	Major Collector (4)	A
Drew/Austin	Major Collector						Major Collector (4)	
El Centro/SR-111	Minor Arterial						Minor Arterial (4)	
SR-111/Mets	Local	N/A	560	2,120	1.64	3,500	Minor Collector (2)	B
<b>Ruegger Road</b>								
Kalin/SR-111	Minor Collector						Minor Collector (2)	
<b>Rutherford Road (S26)</b>								
Proposed Banister/Kalin							Major Collector (4)	
Kalin/Butters	Major Collector						Major Collector (4)	
Butters/Irvine	Minor Collector						Minor Collector (2)	
<b>Schartz Road</b>								
Proposed SR-86/Dogwood	None						Major Collector (4)	
Dogwood/McConnell	Minor Collector						Major Collector (4)	
Proposed McConnell/River	None						Major Collector (4)	
<b>Seybert Road</b>								
Taecker/SR-78	Minor Collector						Minor Collector	
<b>Shank Road</b>								
Best/SR-115	Minor Arterial						Minor Arterial (4)	
SR-115/Irvine	Minor Collector						Minor Collector (2)	
<b>Silsbee Road</b>								
Evan Hewes Hwy/McCabe	Minor Collector						Minor Collector (2)	
<b>Sinclair Road</b>								
Gentry/SR-111	Major Collector						Prime Arterial (6-divided)	
SR-111/Weist	Minor Collector						Minor Collector (2)	
<b>Slayton Road</b>								
Worthington/Holtville (City)	Minor Collector						Minor Collector (2)	
<b>Snyder Road</b>								
Worthington/Bonds Corner Road	Minor Collector						Minor Collector (2)	
<b>Stahl Road</b>								
McConnell/End	Minor Collector						Minor Collector (2)	
<b>Streiby Road</b>								
Fifield/Wiest	Minor Collector						Minor Collector (2)	
<b>Taecker Road</b>								
Seybert/Hastain	Minor Collector						Minor Collector (2)	
<b>Titworth Road</b>								
Butters/End	Minor Collector						Minor Collector (2)	
<b>Townsend Road</b>								
SR-115/Holt	Minor Collector						Minor Collector (2)	
<b>Vail Road</b>								
Lack/Kalin	Minor Collector						Minor Collector (2)	
<b>Van Der Linden</b>								
Hunt/Connelly	Minor Collector						Minor Collector (2)	
<b>Vencill Road</b>								
Connelly/Heber	Minor Collector						Minor Collector (2)	

**TABLE 3**  
**IMPERIAL COUNTY PROJECTED STREET SEGMENT CONFIGURATIONS AND**  
**VOLUMES (continued)**

Segment Location	2003 Classification	Year 2002 ADT Volume <sup>a</sup>	Year 2005 ADT Volume <sup>a</sup>	Year 2025 ADT Volume <sup>c</sup>	25 Year Total Growth Factor <sup>d</sup>	Year 2050 ADT Volume	Year 2050 Recommended Classification (# of Lanes)	2050 LOS <sup>e</sup>
<b>Verde School Road</b>								
Keffer/Bornt	Minor Collector						Minor Collector (2)	
<b>Villa Road</b>								
Dogwood/Cooley	Minor Collector						Minor Collector (2)	
<b>Wahl Road</b>								
Nichols/Clark	Minor Collector						Minor Collector (2)	
<b>Walker Road</b>								
Gentry/End	Major Collector						Major Collector (4)	
Gentry/Brandt	Minor Collector						Minor Collector (2)	
<b>Ware Road</b>								
Fawcett/Willoughby	Major Collector						Major Collector (4)	
<b>Weaver Road</b>								
Kalin/SR-86	Minor Collector						Minor Collector (2)	
<b>Webster Road</b>								
Kalin/Brandt	Minor Collector						Minor Collector (2)	
<b>Westmorland Road</b>								
Boley/Evan Hewes Hwy	Minor Collector						Minor Collector (2)	
<b>Westside Road</b>								
Evan Hewes Hwy/End	Minor Collector						Minor Collector (2)	
<b>Wheeler Road</b>								
Erskine/Pierle	Minor Collector						Minor Collector (2)	
<b>Wieman Road</b>								
Steiner/Cady	Minor Collector						Minor Collector (2)	
<b>Wienert Road</b>								
Guthrie/Forrester	Minor Collector						Minor Collector (2)	
<b>Wiest Road</b>								
SR-78/Griffin	Minor Collector						Minor Collector (2)	
Griffin/Boyd	Local						Minor Collector (2)	
McDonald/SR-115	Minor Collector						Minor Collector (2)	
<b>Wilkins Road</b>								
English/Cuff	Minor Collector						Minor Collector (2)	
<b>Wilkinson Road</b>								
Brandt/SR-111	Minor Collector						Minor Collector (2)	
Wiest/Flett	Minor Collector						Minor Collector (2)	
<b>Willoughby Road</b>								
Proposed La Brucherie/Clark	none						Major Collector (4)	
Clark/Dogwood	Minor Collector						Major Collector (4)	
Dogwood/Kloke	Major Collector						Major Collector (4)	
<b>Wirt Road</b>								
Wiest/Kaiser	Minor Collector						Minor Collector (2)	
<b>Wixom Road</b>								
Liebert/Drew	Minor Collector						Minor Collector (2)	
<b>Wormwood Road</b>								
Dearborn/Fisher	Minor Collector						Minor Collector (2)	
<b>Worthington Road (S28)</b>								
Huff/Highline	Major Collector						Major Collector (4)	
<b>Yocum Road</b>								
Proposed Dogwood/Lyerly	none						Major Collector (2)	
Lyerly/Kershaw	Minor Collector						Major Collector (4)	
Kershaw/Blair	Local						Major Collector (4)	
<b>Young Road</b>								
SR-111/Blair	Minor Collector						Minor Collector (2)	
<b>Zenos Road</b>								
Barbara Worth/Holtville (City)	Minor Collector						Minor Collector (2)	
<b>State Route 78</b>								
S.D.-Imperial County Line/Junction SR-86	State Hwy	N/A	920	8,104	1.64	13,500	Collector (4)	A
SR-111/SR-115N	State Hwy	N/A	3,950	10,592	1.64	17,500	Collector (4)	B
SR-115N/SR-115S	State Hwy	N/A	3,100	13,447	1.64	22,500	Collector (4)	B
115S/Glamis	State Hwy	N/A	1,950	7,340	1.64	12,500	Collector (4)	A
Glamis/Ogilby	State Hwy	N/A	1,850	4,909	1.64	8,500	Collector (4)	A
Ogilby/Palo Verde, Fourth	State Hwy	N/A	2,000	5,307	1.64	9,000	Collector (4)	A
Palo Verde, Fourth/Imperial County Line	State Hwy	N/A	2,000	5,307	1.64	9,000	Collector (4)	A

**TABLE 3**  
**IMPERIAL COUNTY PROJECTED STREET SEGMENT CONFIGURATIONS AND**  
**VOLUMES (continued)**

Segment Location	2003 Classification	Year 2002 ADT Volume <sup>a</sup>	Year 2005 ADT Volume <sup>a</sup>	Year 2025 ADT Volume <sup>c</sup>	25 Year Total Growth Factor <sup>d</sup>	Year 2050 ADT Volume	Year 2050 Recommended Classification (# of Lanes)	2050 LOS <sup>e</sup>
<b>State Route 86</b>								
Imperial County Line/Desert Shores	State Hwy	N/A	12,900	21,138	1.28	27,500	Minor Arterial (4)	C
Desert Shores/Brawley Ave.	State Hwy	N/A	12,400	20,319	1.28	26,500	Collector (4)	C
Brawley Ave./S. Marina	State Hwy	N/A	13,400	21,957	1.28	28,500	Minor Arterial (4)	C
S. Marina/Air Park	State Hwy	N/A	12,100	19,827	1.64	33,000	Prime Arterial (6-divided)	B
Air Park/SR-78 West	State Hwy	N/A	10,800	17,697	1.64	29,500	Minor Arterial (4)	C
SR-78 West/Lack	State Hwy	N/A	10,800	17,890	1.64	29,500	Minor Arterial (4)	C
Lack/West Westmorland City Limits	State Hwy	N/A	10,200	19,650	1.64	32,500	Prime Arterial (6-divided)	B
E Westmorland C. Limits/W Brawley C. Limits	State Hwy	N/A	14,000	19,440	1.64	32,000	Prime Arterial (6-divided)	B
South Brawley City Limits/Legion	State Hwy	N/A	21,400	28,300	1.13	32,500	Prime Arterial (6-divided)	B
Legion/Keystone	State Hwy	N/A	19,100	27,940	1.13	32,000	Prime Arterial (6-divided)	B
Keystone/Imperial Ave.	State Hwy	N/A	14,700	27,980	1.13	32,000	Prime Arterial (6-divided)	B
I-8/McCabe	State Hwy	N/A	21,500	24,890	1.28	32,000	Prime Arterial (6-divided)	B
McCabe/Heber	State Hwy	N/A	7,100	26,100	1.28	33,500	Prime Arterial (6-divided)	B
Heber/Dogwood	State Hwy	N/A	7,500	26,100	1.28	33,500	Prime Arterial (6-divided)	B
Dogwood/SR-111	State Hwy	N/A	5,200	26,000	1.28	33,500	Prime Arterial (6-divided)	B
South Imperial City Limits/North El Centro City Limits	State Hwy	N/A	6,500	27,980	1.13	32,000	Prime Arterial (6-divided)	B
<b>State Route 98</b>								
Imperial Hwy/Drew	State Hwy	N/A	2,300	1,730	1.64	3,000	Local Collector (2)	B
Drew/Clark	State Hwy	N/A	3,800	5,350	1.64	9,000	Collector (4)	A
Clark/Dogwood	State Hwy	N/A	4,550	8,800	1.64	14,500	Collector (4)	B
Dogwood/West Calexico City Limits	State Hwy	N/A	9,800	24,180	1.64	31,500	Prime Arterial (6-divided)	B
East Calexico City Limits/Barbara Worth	State Hwy	N/A	24,400	26,000	1.64	33,500	Prime Arterial (6-divided)	B
Barbara Worth/Bonds Corner	State Hwy	N/A	16,300	26,000	1.64	33,500	Prime Arterial (6-divided)	B
Bonds Corner/E. Highline Canal	State Hwy	N/A	4,500	770	1.64	1,500	Local Collector (2)	A
E. Highline Canal/I-8	State Hwy	N/A	2,200	250	1.64	500	Local Collector (2)	A
<b>State Route 111</b>								
North Calexico City Limits	State Hwy	N/A	50,000	97,570	1.13	111,000	Freeway (8)	C
Heber/McCabe	State Hwy	N/A	33,500	98,650	1.13	112,000	Freeway (8)	C
McCabe/I-8	State Hwy	N/A	37,000	90,830	1.13	103,000	Freeway (8)	C
I-8/Evan Hewes Hwy	State Hwy	N/A	16,300	52,980	1.13	60,500	Expressway (6)	D
Evan Hewes/Aten	State Hwy	N/A	14,100	60,200	1.13	68,500	Expressway (6)	D
Aten/Worthington	State Hwy	N/A	11,300	58,160	1.13	66,000	Expressway (6)	D
Worthington/Keystone	State Hwy	N/A	10,600	58,710	1.13	67,000	Expressway (6)	D
Keystone/E. Junction 78	State Hwy	N/A	9,300	57,590	1.13	65,500	Expressway (6)	D
North Brawley City Limits/Rutherford	State Hwy	N/A	9,500	18,510	1.64	30,500	Prime Arterial (6-divided)	B
Rutherford/South Calipatria City Limits	State Hwy	N/A	6,600	18,560	1.64	30,500	Prime Arterial (6-divided)	B
North Calipatria City Limits/Sinclair	State Hwy	N/A	5,700	15,640	1.64	26,000	Minor Arterial (4)	C
Sinclair/Niland Ave	State Hwy	N/A	5,100	13,532	1.64	22,500	Collector (4)	B
Niland Ave/English	State Hwy	N/A	3,700	9,817	1.64	16,500	Collector (4)	B
English/Bombay Beach	State Hwy	N/A	2,300	6,103	1.64	10,500	Collector (4)	A
Bombay Beach/Imperial-Riverside County line	State Hwy	N/A	1,900	5,041	1.64	8,500	Collector (4)	A
<b>State Route 115</b>								
Junction I-8/East Holtville City Limits	State Hwy	N/A	1,850	4,140	1.64	7,000	Local Collector (2)	C
West Holtville City Limits/West Junction Evan Hewes Hwy	State Hwy	N/A	6,600	8,320	1.64	14,000	Collector (4)	B
West Junction Evan Hewes Hwy/SR-78	State Hwy	N/A	2,850	27,870	1.13	32,000	Prime Arterial (6-divided)	B
SR-78/Rutherford	State Hwy	N/A	990	13,450	1.64	22,500	Minor Arterial (4)	B
Rutherford/Wirt	State Hwy	N/A	1,650	9,720	1.64	16,000	Collector (4)	B
Wirt/East Calipatria City Limits	State Hwy	N/A	1,150	9,240	1.64	15,500	Collector (4)	B
<b>State Route 186</b>								
I-8/International Border	State Hwy	N/A					State Hwy	

Notes:

\* See Table 1 regarding additional right-of-way for transit facility with roadway.

a. Volume from Imperial County Circulation and Scenic Highways Element Manual (Dec. 2003).

b. Volume from Caltrans, Imperial County, or Linscott Law & Greenspan, Engineers counts.

c. Volumes from Caltrans CalxGP+ Model and adjusted higher in some cases.

d. A 0.5%, 1.0%, or 2.0% annual growth rate was applied to the Year 2025 volumes to obtain Year 2050 volumes.

e. Capacity based on the Imperial County Classification Table (depending on the Year 2050 volume amount).

**Street Segment Configurations and Volumes Interpolated to Year 2030 from listed Year  
2025 and Year 2050 Volumes**










Segment	Year	Year	Year
	2025	2030	2050
Interpolated and Rounded			
<b><u>Clark Road</u></b>			
Ross Avenue to McCabe Road	2,756	3,100	4,500
McCabe Road to SR-98	2,756	3,100	4,500
<b><u>McCabe Road</u></b>			
Austin Road to La Brucheri Road	Vol. Not Listed	Vol. Not Listed	Vol. Not Listed

## **Appendix R**

### **Existing + Cumulative + Project Intersection LOS and Fair Share Calculations**

















AM 2012 + Cumulative + Project  
2: Project Access & Dunaway Rd

With Mitigation  
HCM Unsignalized Intersection Capacity Analysis

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Stop			Stop
Volume (vph)	5	1	138	270	30	288
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	5	1	150	293	33	313
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total (vph)	7	443	346			
Volume Left (vph)	5	0	33			
Volume Right (vph)	1	293	0			
Hadj (s)	0.10	-0.36	0.05			
Departure Headway (s)	5.6	3.9	4.4			
Degree Utilization, x	0.01	0.48	0.42			
Capacity (veh/h)	558	908	805			
Control Delay (s)	8.7	10.5	10.5			
Approach Delay (s)	8.7	10.5	10.5			
Approach LOS	A	B	B			
Intersection Summary						
Delay			10.5			
HCM Level of Service			B			
Intersection Capacity Utilization			50.1%	ICU Level of Service	A	
Analysis Period (min)			15			

















AM 2012 + Cumulative + Project  
3: I-8 WB Ramp & Dunaway Rd

With Mitigation  
HCM Signalized Intersection Capacity Analysis

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	2	0	788	0	355	0	0	19	136
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					4.0	4.0		4.0			4.0	
Lane Util. Factor					1.00	1.00		1.00			1.00	
Frt					1.00	0.85		1.00			0.88	
Flt Protected					0.95	1.00		1.00			1.00	
Satd. Flow (prot)					1770	1583		1863			1643	
Flt Permitted					0.95	1.00		1.00			1.00	
Satd. Flow (perm)					1770	1583		1863			1643	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	2	0	857	0	386	0	0	21	148
RTOR Reduction (vph)	0	0	0	0	0	422	0	0	0	0	127	0
Lane Group Flow (vph)	0	0	0	0	2	435	0	386	0	0	42	0
Turn Type				Perm		Perm	Split					
Protected Phases					8		2	2			6	
Permitted Phases				8		8						
Actuated Green, G (s)					16.1	16.1		14.2			7.0	
Effective Green, g (s)					16.1	16.1		14.2			7.0	
Actuated g/C Ratio					0.33	0.33		0.29			0.14	
Clearance Time (s)					4.0	4.0		4.0			4.0	
Vehicle Extension (s)					3.0	3.0		3.0			3.0	
Lane Grp Cap (vph)					578	517		537			233	
v/s Ratio Prot								c0.21			c0.03	
v/s Ratio Perm					0.00	c0.27						
v/c Ratio					0.00	0.84		0.72			0.18	
Uniform Delay, d1					11.2	15.4		15.8			18.6	
Progression Factor					1.00	1.00		1.00			1.00	
Incremental Delay, d2					0.0	11.8		4.6			0.4	
Delay (s)					11.2	27.2		20.3			19.0	
Level of Service					B	C		C			B	
Approach Delay (s)		0.0			27.1			20.3			19.0	
Approach LOS		A			C			C			B	
<b>Intersection Summary</b>												
HCM Average Control Delay			24.3				HCM Level of Service			C		
HCM Volume to Capacity ratio			0.67									
Actuated Cycle Length (s)			49.3				Sum of lost time (s)		12.0			
Intersection Capacity Utilization			74.1%				ICU Level of Service		D			
Analysis Period (min)			15									
c Critical Lane Group												

















AM 2012 + Cumulative + Project  
4: I-8 EB Ramp & Dunaway Rd

With Mitigation  
HCM Signalized Intersection Capacity Analysis

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	351	1	0	0	0	0	0	0	1	22	3	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0						4.0			4.0	
Lane Util. Factor		1.00						1.00			1.00	
Frt		1.00						0.86			1.00	
Flt Protected		0.95						1.00			0.96	
Satd. Flow (prot)		1774						1611			1783	
Flt Permitted		0.95						1.00			0.96	
Satd. Flow (perm)		1774						1611			1783	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	382	1	0	0	0	0	0	0	1	24	3	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	1	0	0	0	0
Lane Group Flow (vph)	0	383	0	0	0	0	0	0	0	0	27	0
Turn Type	Perm		Perm							Split		
Protected Phases		4						2		6	6	
Permitted Phases	4		4									
Actuated Green, G (s)		13.4						5.5			6.1	
Effective Green, g (s)		13.4						5.5			6.1	
Actuated g/C Ratio		0.36						0.15			0.16	
Clearance Time (s)		4.0						4.0			4.0	
Vehicle Extension (s)		3.0						3.0			3.0	
Lane Grp Cap (vph)		642						239			294	
v/s Ratio Prot								c0.00			c0.02	
v/s Ratio Perm		0.22										
v/c Ratio		0.60						0.00			0.09	
Uniform Delay, d1		9.6						13.4			13.1	
Progression Factor		1.00						1.00			1.00	
Incremental Delay, d2		1.5						0.0			0.1	
Delay (s)		11.1						13.4			13.2	
Level of Service		B						B			B	
Approach Delay (s)		11.1			0.0			13.4			13.2	
Approach LOS		B			A			B			B	
<b>Intersection Summary</b>												
HCM Average Control Delay		11.2						HCM Level of Service		B		
HCM Volume to Capacity ratio		0.34										
Actuated Cycle Length (s)		37.0						Sum of lost time (s)		12.0		
Intersection Capacity Utilization		34.2%						ICU Level of Service		A		
Analysis Period (min)		15										
c Critical Lane Group												










AM 2012 + Cumulative + Project  
8: I-8 EB Ramp & Forrester Road

With Mitigation  
HCM Signalized Intersection Capacity Analysis

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	123	0	8	0	0	0	0	113	22	215	220	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0					4.0			4.0	
Lane Util. Factor		1.00	1.00					1.00			1.00	
Frt		1.00	0.85					0.98			1.00	
Flt Protected		0.95	1.00					1.00			0.98	
Satd. Flow (prot)		1770	1583					1822			1818	
Flt Permitted		0.95	1.00					1.00			0.98	
Satd. Flow (perm)		1770	1583					1822			1818	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	134	0	9	0	0	0	0	123	24	234	239	0
RTOR Reduction (vph)	0	0	8	0	0	0	0	13	0	0	0	0
Lane Group Flow (vph)	0	134	1	0	0	0	0	134	0	0	473	0
Turn Type	Perm		Perm							Split		
Protected Phases		4						2		6	6	
Permitted Phases	4		4									
Actuated Green, G (s)		7.0	7.0					8.5			16.3	
Effective Green, g (s)		7.0	7.0					8.5			16.3	
Actuated g/C Ratio		0.16	0.16					0.19			0.37	
Clearance Time (s)		4.0	4.0					4.0			4.0	
Vehicle Extension (s)		3.0	3.0					3.0			3.0	
Lane Grp Cap (vph)		283	253					354			677	
v/s Ratio Prot								c0.07			c0.26	
v/s Ratio Perm		0.08	0.00									
v/c Ratio		0.47	0.01					0.38			0.70	
Uniform Delay, d1		16.7	15.5					15.4			11.7	
Progression Factor		1.00	1.00					1.00			1.00	
Incremental Delay, d2		1.3	0.0					0.7			3.2	
Delay (s)		18.0	15.5					16.0			14.8	
Level of Service		B	B					B			B	
Approach Delay (s)		17.8			0.0			16.0			14.8	
Approach LOS		B			A			B			B	
Intersection Summary												
HCM Average Control Delay			15.6		HCM Level of Service					B		
HCM Volume to Capacity ratio			0.56									
Actuated Cycle Length (s)			43.8		Sum of lost time (s)					12.0		
Intersection Capacity Utilization			47.6%		ICU Level of Service					A		
Analysis Period (min)			15									
c Critical Lane Group												

















PM 2012 + Cumulative + Project  
2: Project Access & Dunaway Rd

HCM Unsignalized Intersection Capacity Analysis

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Stop			Stop
Volume (vph)	270	30	398	14	1	193
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	293	33	433	15	1	210
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total (vph)	326	448	211			
Volume Left (vph)	293	0	1			
Volume Right (vph)	33	15	0			
Hadj (s)	0.15	0.01	0.04			
Departure Headway (s)	5.8	5.3	5.7			
Degree Utilization, x	0.53	0.66	0.33			
Capacity (veh/h)	583	656	595			
Control Delay (s)	15.1	17.9	11.4			
Approach Delay (s)	15.1	17.9	11.4			
Approach LOS	C	C	B			
Intersection Summary						
Delay			15.6			
HCM Level of Service			C			
Intersection Capacity Utilization			45.2%	ICU Level of Service	A	
Analysis Period (min)			15			

















PM 2012 + Cumulative + Project  
3: I-8 WB Ramp & Dunaway Rd

HCM Signalized Intersection Capacity Analysis

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	1	3	16	0	247	0	0	779	219
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					4.0	4.0		4.0			4.0	
Lane Util. Factor					1.00	1.00		1.00			1.00	
Frt					1.00	0.85		1.00			0.97	
Flt Protected					0.99	1.00		1.00			1.00	
Satd. Flow (prot)					1851	1583		1863			1808	
Flt Permitted					0.99	1.00		1.00			1.00	
Satd. Flow (perm)					1851	1583		1863			1808	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor (vph)	100%	100%	100%	100%	200%	100%	100%	100%	100%	100%	100%	100%
Adj. Flow (vph)	0	0	0	1	7	17	0	268	0	0	847	238
RTOR Reduction (vph)	0	0	0	0	0	17	0	0	0	0	8	0
Lane Group Flow (vph)	0	0	0	0	8	0	0	268	0	0	1077	0
Turn Type				Perm		Perm	Split					
Protected Phases					8		2	2			6	
Permitted Phases				8		8						
Actuated Green, G (s)					2.5	2.5		15.5			56.3	
Effective Green, g (s)					2.5	2.5		15.5			56.3	
Actuated g/C Ratio					0.03	0.03		0.18			0.65	
Clearance Time (s)					4.0	4.0		4.0			4.0	
Vehicle Extension (s)					3.0	3.0		3.0			3.0	
Lane Grp Cap (vph)					54	46		335			1179	
v/s Ratio Prot								c0.14			c0.60	
v/s Ratio Perm					0.00	0.00						
v/c Ratio					0.15	0.01		0.80			0.91	
Uniform Delay, d1					40.9	40.7		33.9			12.9	
Progression Factor					1.00	1.00		1.00			1.00	
Incremental Delay, d2					1.3	0.1		12.8			10.8	
Delay (s)					42.1	40.8		46.7			23.7	
Level of Service					D	D		D			C	
Approach Delay (s)		0.0			41.2			46.7			23.7	
Approach LOS		A			D			D			C	
<b>Intersection Summary</b>												
HCM Average Control Delay			28.5		HCM Level of Service						C	
HCM Volume to Capacity ratio			0.86									
Actuated Cycle Length (s)			86.3		Sum of lost time (s)					12.0		
Intersection Capacity Utilization			64.3%		ICU Level of Service					C		
Analysis Period (min)			15									
c Critical Lane Group												

















PM 2012 + Cumulative + Project  
4: I-8 EB Ramp & Dunaway Rd

HCM Signalized Intersection Capacity Analysis

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	247	0	3	0	0	0	0	0	6	780	1	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0					4.0			4.0	
Lane Util. Factor		1.00	1.00					1.00			1.00	
Frt		1.00	0.85					0.86			1.00	
Flt Protected		0.95	1.00					1.00			0.95	
Satd. Flow (prot)		1770	1583					1611			1774	
Flt Permitted		0.95	1.00					1.00			0.95	
Satd. Flow (perm)		1770	1583					1611			1774	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	268	0	3	0	0	0	0	0	7	848	1	0
RTOR Reduction (vph)	0	0	2	0	0	0	0	6	0	0	0	0
Lane Group Flow (vph)	0	268	1	0	0	0	0	1	0	0	849	0
Turn Type	Perm		Perm						Split			
Protected Phases			4				2		6		6	
Permitted Phases	4		4									
Actuated Green, G (s)			15.2				5.6				41.7	
Effective Green, g (s)			15.2				5.6				41.7	
Actuated g/C Ratio			0.20				0.08				0.56	
Clearance Time (s)			4.0				4.0				4.0	
Vehicle Extension (s)			3.0				3.0				3.0	
Lane Grp Cap (vph)			361				121				993	
v/s Ratio Prot							c0.00				c0.48	
v/s Ratio Perm			0.15									
v/c Ratio			0.74				0.00				0.85	
Uniform Delay, d1			27.8				31.9				13.8	
Progression Factor			1.00				1.00				1.00	
Incremental Delay, d2			8.0				0.0				7.3	
Delay (s)			35.8				31.9				21.2	
Level of Service			D				C				C	
Approach Delay (s)			35.7		0.0		31.9				21.2	
Approach LOS			D		A		C				C	
Intersection Summary												
HCM Average Control Delay			24.7		HCM Level of Service				C			
HCM Volume to Capacity ratio			0.75									
Actuated Cycle Length (s)			74.5		Sum of lost time (s)				12.0			
Intersection Capacity Utilization			70.3%		ICU Level of Service				C			
Analysis Period (min)			15									
c Critical Lane Group												

PM 2012 + Cumulative + Project  
8: I-8 EB Ramp & Forrester Road

HCM Signalized Intersection Capacity Analysis

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	266	0	45	0	0	0	0	157	99	333	162	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0					4.0			4.0	
Lane Util. Factor		1.00	1.00					1.00			1.00	
Frt		1.00	0.85					0.95			1.00	
Flt Protected		0.95	1.00					1.00			0.97	
Satd. Flow (prot)		1770	1583					1765			1802	
Flt Permitted		0.95	1.00					1.00			0.97	
Satd. Flow (perm)		1770	1583					1765			1802	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	289	0	49	0	0	0	0	171	108	362	176	0
RTOR Reduction (vph)	0	0	28	0	0	0	0	36	0	0	0	0
Lane Group Flow (vph)	0	289	21	0	0	0	0	243	0	0	538	0
Turn Type	Perm		Perm							Split		
Protected Phases		4						2		6	6	
Permitted Phases	4		4									
Actuated Green, G (s)		13.5	13.5					12.5			20.2	
Effective Green, g (s)		13.5	13.5					12.5			20.2	
Actuated g/C Ratio		0.23	0.23					0.21			0.35	
Clearance Time (s)		4.0	4.0					4.0			4.0	
Vehicle Extension (s)		3.0	3.0					3.0			3.0	
Lane Grp Cap (vph)		411	367					379			625	
v/s Ratio Prot								c0.14			c0.30	
v/s Ratio Perm		0.16	0.01									
v/c Ratio		0.70	0.06					0.64			0.86	
Uniform Delay, d1		20.5	17.4					20.8			17.7	
Progression Factor		1.00	1.00					1.00			1.00	
Incremental Delay, d2		5.4	0.1					3.7			11.7	
Delay (s)		25.9	17.5					24.5			29.3	
Level of Service		C	B					C			C	
Approach Delay (s)		24.7			0.0			24.5			29.3	
Approach LOS		C			A			C			C	
Intersection Summary												
HCM Average Control Delay			26.8		HCM Level of Service				C			
HCM Volume to Capacity ratio			0.76									
Actuated Cycle Length (s)			58.2		Sum of lost time (s)				12.0			
Intersection Capacity Utilization			66.0%		ICU Level of Service				C			
Analysis Period (min)			15									
c Critical Lane Group												

### ***Fair Share Calculations***

#### **2) Dunaway/Project Access**

Cumulative AM =	359	Fairshare Calculation	
<u>Project Construction Traffic AM =</u>	306	Project / (Cumulative + Project) =	46.0%

Cumulative PM =	(540)	Fairshare Calculation	
<u>Project Construction Traffic PM =</u>	(315)	Project / (Cumulative + Project) =	36.8%

**Average of AM and PM peak (based on Construction Traffic) = 41.4%**

Cumulative AM =	359	Fairshare Calculation	
<u>Project Operation Traffic AM =</u>	4	Project / (Cumulative + Project) =	1.1%

Cumulative PM =	(540)	Fairshare Calculation	
<u>Project Operation Traffic PM =</u>	(4)	Project / (Cumulative + Project) =	0.7%

**Average of AM and PM peak (based on Operations Traffic) = 0.9%**

### ***Fair Share Calculations***

#### **3) Dunaway/I-8 WB Ramps**

Cumulative AM =	956	Fairshare Calculation	
<u>Project Construction Traffic AM =</u>	275	Project / (Cumulative + Project) =	22.3%

Cumulative PM =	(927)	Fairshare Calculation	
<u>Project Construction Traffic PM =</u>	(284)	Project / (Cumulative + Project) =	23.5%

**Average of AM and PM peak (based on Construction Traffic) = 22.9%**

Cumulative AM =	956	Fairshare Calculation	
<u>Project Operation Traffic AM =</u>	4	Project / (Cumulative + Project) =	0.4%

Cumulative PM =	(927)	Fairshare Calculation	
<u>Project Operation Traffic PM =</u>	(4)	Project / (Cumulative + Project) =	0.4%

**Average of AM and PM peak (based on Operations Traffic) = 0.4%**

### ***Fair Share Calculations***

#### **4) Dunaway/I-8 EB Ramps**

Cumulative AM =	302	Fairshare Calculation	
<u>Project Construction Traffic AM =</u>	49	Project / (Cumulative + Project) =	14.0%

Cumulative PM =	(774)	Fairshare Calculation	
<u>Project Construction Traffic PM =</u>	(227)	Project / (Cumulative + Project) =	22.7%

**Average of AM and PM peak (based on Construction Traffic) = 18.3%**

Cumulative AM =	302	Fairshare Calculation	
<u>Project Operation Traffic AM =</u>	4	Project / (Cumulative + Project) =	1.3%

Cumulative PM =	(774)	Fairshare Calculation	
<u>Project Operation Traffic PM =</u>	(4)	Project / (Cumulative + Project) =	0.5%

**Average of AM and PM peak (based on Operations Traffic) = 0.9%**

#### **8) Forrester/I-8 EB Ramps**

Cumulative AM =	373	Fairshare Calculation	
<u>Project Construction Traffic AM =</u>	32	Project / (Cumulative + Project) =	7.9%

Cumulative PM =	(579)	Fairshare Calculation	
<u>Project Construction Traffic PM =</u>	(76)	Project / (Cumulative + Project) =	11.6%

**Average of AM and PM peak (based on Construction Traffic) = 9.8%**

Cumulative AM =	373	Fairshare Calculation	
<u>Project Operation Traffic AM =</u>	1	Project / (Cumulative + Project) =	0.3%

Cumulative PM =	(579)	Fairshare Calculation	
<u>Project Operation Traffic PM =</u>	(1)	Project / (Cumulative + Project) =	0.2%

**Average of AM and PM peak (based on Operations Traffic) = 0.2%**